

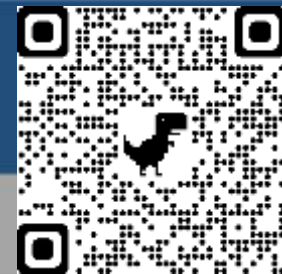
Class will begin soon!



Central Indiana Spotter Training 2022



Before We Get Started



- A PDF version of these slides with speaker notes, URLs and other resources are available on our Spotter Webpage.
<https://www.weather.gov/ind/spotter>
- Use the camera on your smart phone to scan QR Codes for most websites shown in this presentation.
- Central Indiana SKYWARN Spotters DO NOT receive spotter ID numbers and are considered volunteers





SKYWARN Spotter and Reporting Procedures





What is SKYWARN?



SKYWARN® is a National Weather Service (NWS) program developed in the 1960s that consists of trained weather spotters who provide reports of severe and hazardous weather to help meteorologists make life-saving warning decisions





What is Required to be a Spotter?



- Complete training every 1 to 3 years
- Become knowledgeable about all forms of severe weather, know what to look for and know how to report what is observed
- Spotters play a critical role in the NWS warning process by adding credibility and confidence to NWS Warnings with ground truth that supports radar signatures
- Relay timely, accurate and credible reports that can help the NWS in warning decisions, EMA Directors and first responders allocate resources faster, and ultimately help save lives





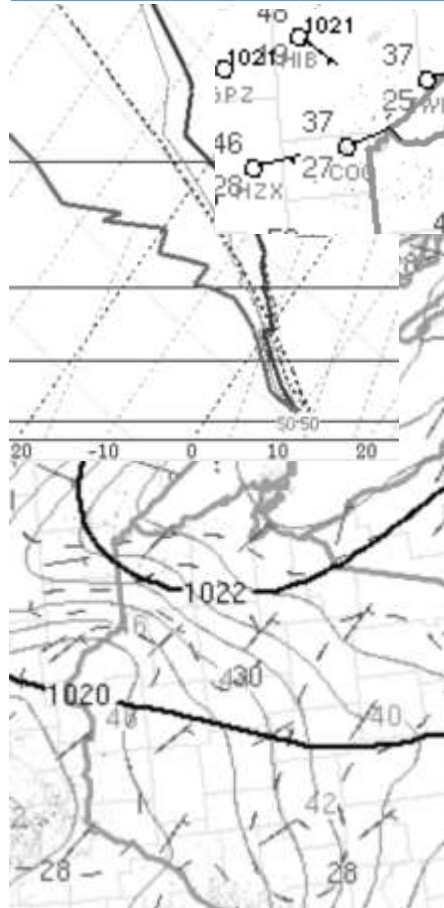
Why are Spotters Important?

Spotters and EMA are a vital part of the warning process

Radar



Environment



Experience



Spotters/EMs





Spotter Reporting Procedures

An Effective Spotter Report Should:

- Be timely, accurate, detailed but concise
- Be Reported in a clear and calm voice
- Follow specific guidelines
 - **Who you are:** Trained NWS Skywarn spotter (No Spotter ID)
 - **What you have witnessed:** Tornado, moving northeast
 - **When the event occurred:** Ongoing right now
 - **Where the event occurred:** I-74 and highway 75 Jamestown, looking north, possibly about two miles. Thin, rope shape, debris being lofted.





Reporting Tornadoes

What is a Tornado?

- Violently rotating columns of air descending from thunderstorm clouds and in contact with the earth
- Usually visible as a funnel shaped cloud
- Winds can be as high as 300 MPH
- Usually less than a few hundred yards wide, last a few minutes, and trace a path of 1 mile or less.





Reporting Tornadoes

- Be extremely cautious. Safety first!
 - Report immediately, as soon as safely possible
- Any rotation on ground?
 - Don't assume on ground if view is obscured
 - How long has it been on ground?
 - Start and end times if known
 - Approximate width and path length
- Extent and amount of damage
 - Don't assume it's from a tornado if you do not see it happen





Reporting Wind and Wind Damage

Let us know when you observe any of the following:

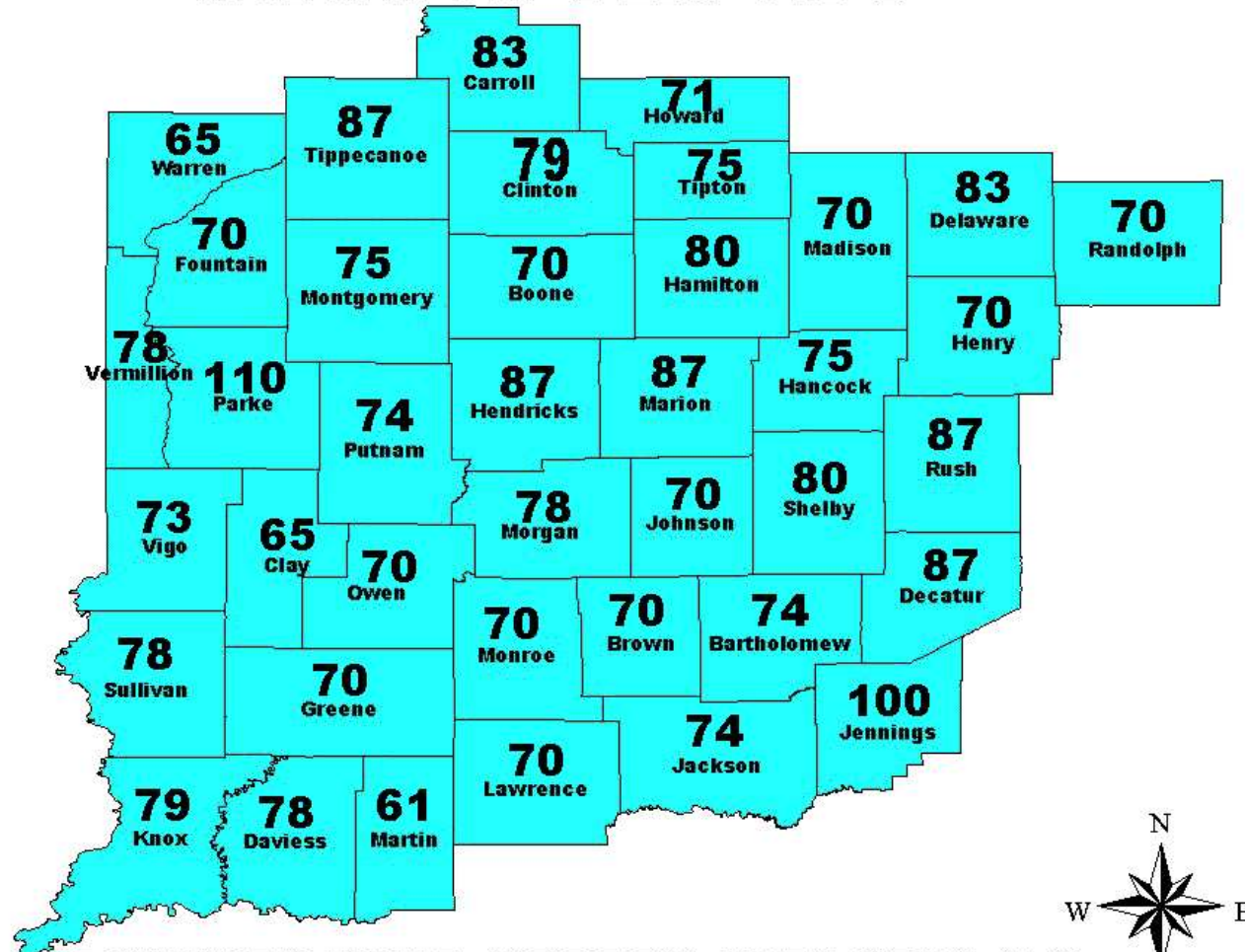
- Wind speeds over 50 mph
 - Report estimated or measured (device type if measured)
- Tree Damage
 - Extent of damage (one or more, full tree or limbs)
 - Uprooted or snapped
 - Height, diameter, general size
 - Health of tree or limbs
- Utility lines or poles down
- Outbuildings or vehicles overturned
- Loss of roofing materials, siding, windows, etc
- Any other significant wind or damage noted



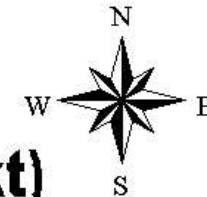


Highest Thunderstorm Winds By County

INDIANAPOLIS WFO



MAXIMUM WIND SPEEDS 1950-2020 (kt)





Reporting and Measuring Hail

Let us know when hail approaches or exceeds the size of a penny or dime (larger than ½")

- Select the largest stone(s) you can find
- Measure across the widest part of the stone

When estimating:

- Use common, standard sized objects such as coins or sports balls

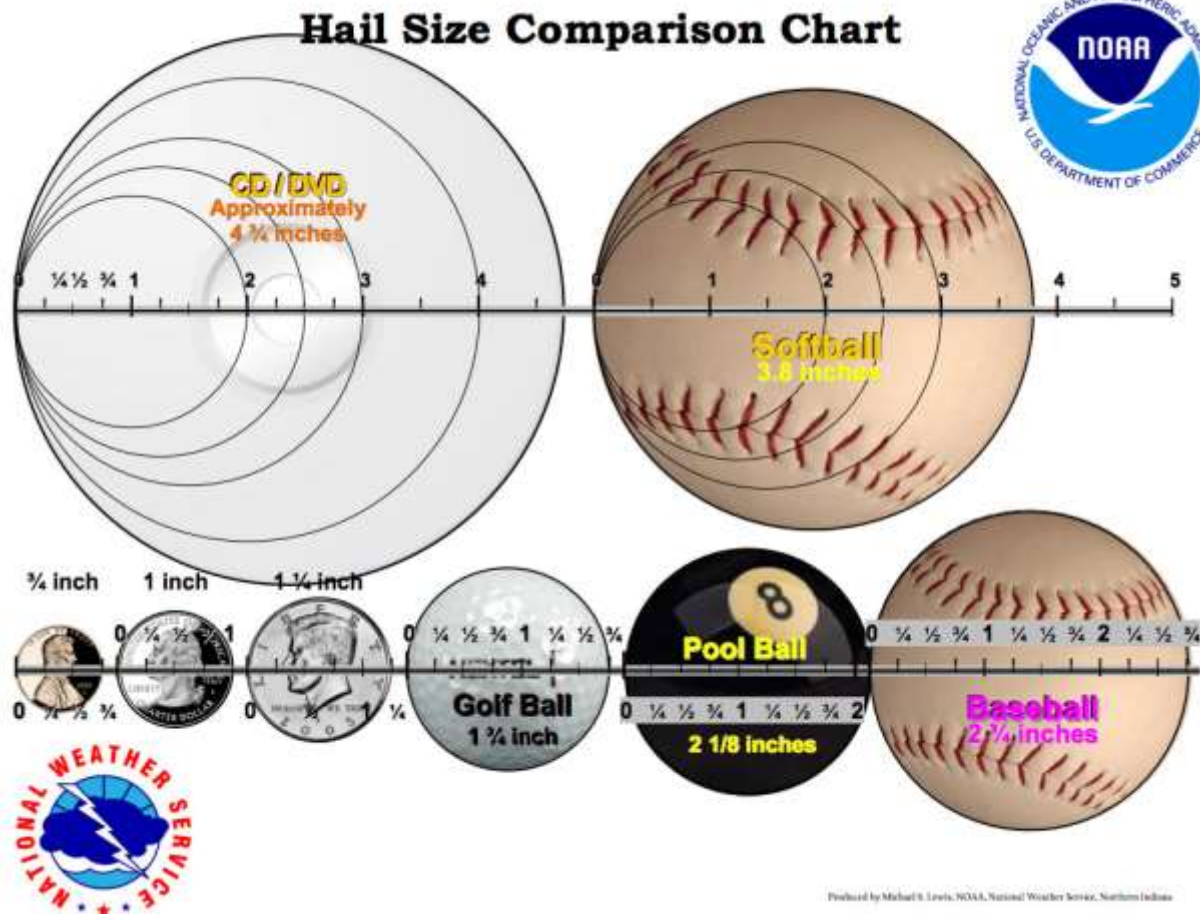


New Palestine, IN June 18th, 2021
3.4" Hail Stone





Reporting and Measuring Hail



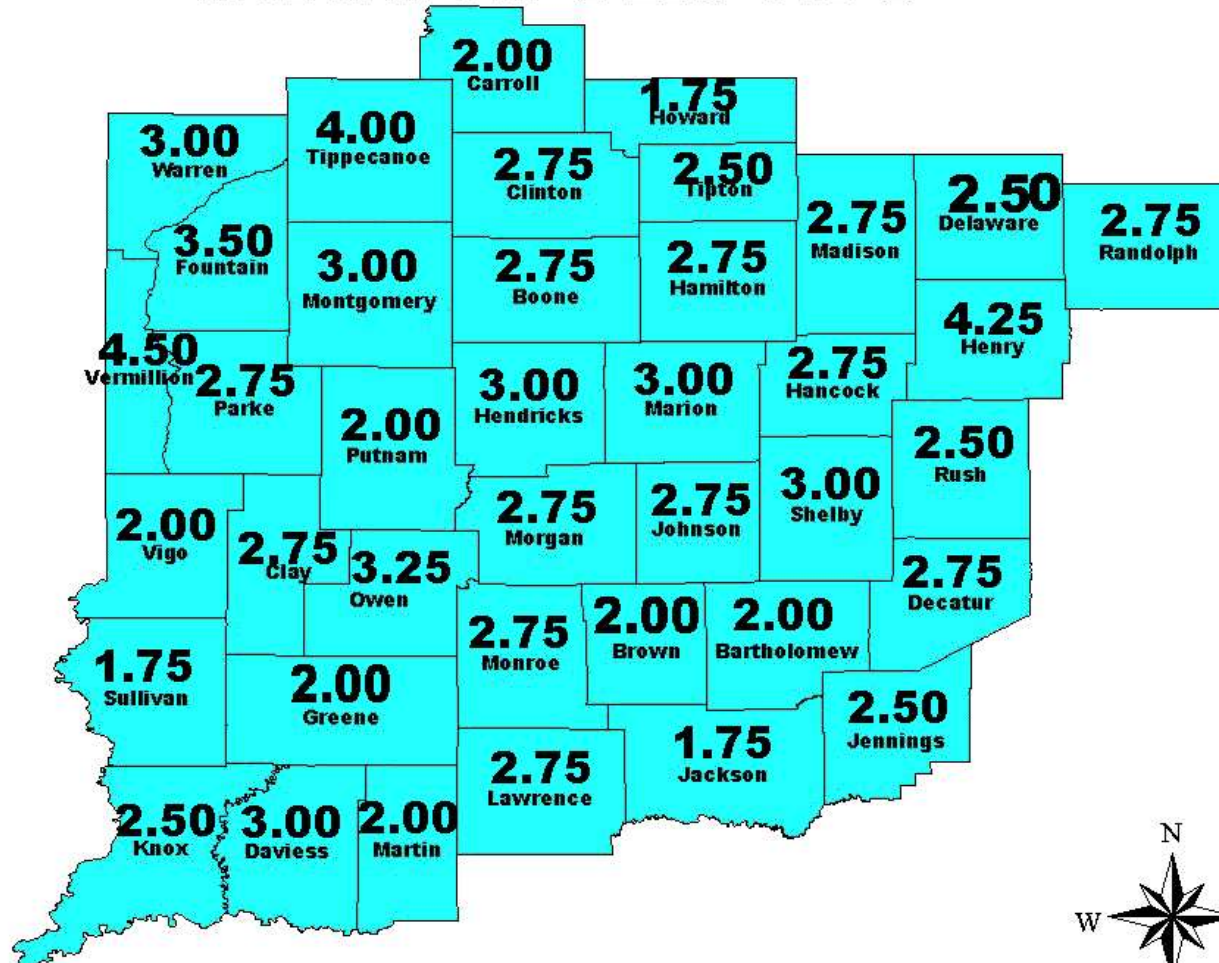
0.25 inches		2.00 inches	
Pea		Hen Egg	
0.75 inches		2.50 inches	
Penny		Tennis Ball	
1.00 inches		2.75 inches	
Quarter		Baseball	
1.50 inches		3.80 inches	
Ping Pong Ball		Softball	
1.75 inches		4.50 inches	
Golf Ball		Grapefruit	



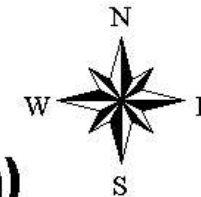


Largest Reported Hail Sizes by County

INDIANAPOLIS WFO



MAXIMUM HAIL SIZES 1950-2020 (in)





Reporting Flooding

Flash Flooding

- Rapidly rising water, lives in immediate danger
- Be careful using this phrase!

Street flooding

- Street names, depth, flowing or standing
- Let us know if there is any visible debris

River flooding

- Name of the river
- What is flooding impacting





How do Spotters report to the NWS?

Contact Your Local NWS Office if not NWS Indianapolis

- Call us @ 1-800-499-2133
 - Spotter reports only!
- Social Media
 - Twitter - @NWSIndianapolis
 - Facebook – @NWSIndianapolis
 - Hashtags - #INwx #NWSIND and any weather related terms such as #Hail or #Tornado
- Email photos with details to:
 - nws.indianapolis@noaa.gov
- Web Reports
 - inws.ncep.noaa.gov/report
 - mping.nssl.noaa.gov
- Amateur (HAM) Radio





Reporting Summary

- You are our trained eyes and ears in the field
- You help Emergency Management, First Responders, and the NWS make better decisions and help save lives with timely reports
- Stay calm and be concise with your reports
- Take pictures or video safely when you can
- Safety is the first priority!





What to Know Before Severe Weather Occurs





Outlook, Watch and Warning

When to Prepare, When to take Action

- **SPC Outlook** - Issued days in advance – “Heads Up”
 - General awareness of severe thunderstorm potential and trends
 - SPC issues Convective outlooks for entire country



Storm Prediction Center Convective Outlooks
Days 1,2,3 and Days 4-8 combined

Understanding Severe Thunderstorm Risk Categories

THUNDERSTORMS (no label)	1 - MARGINAL (MRGL)	2 - SLIGHT (SLGT)	3 - ENHANCED (ENH)	4 - MODERATE (MDT)	5 - HIGH (HIGH)
No severe* thunderstorms expected	Isolated severe thunderstorms possible	Scattered severe storms possible	Numerous severe storms possible	Widespread severe storms likely	Widespread severe storms expected
Lightning/flooding threats exist with <u>all</u> thunderstorms	Limited in duration and/or coverage and/or intensity	Short-lived and/or not widespread, isolated intense storms possible	More persistent and/or widespread, a few intense	Long-lived, widespread and intense	Long-lived, very widespread and particularly intense

* NWS defines a severe thunderstorm as measured wind gusts to at least 58 mph, and/or hail to at least one inch in diameter, and/or a tornado. All thunderstorm categories imply lightning and the potential for flooding. Categories are also tied to the probability of a severe weather event within 25 miles of your location.



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National Weather Service
www.spc.noaa.gov



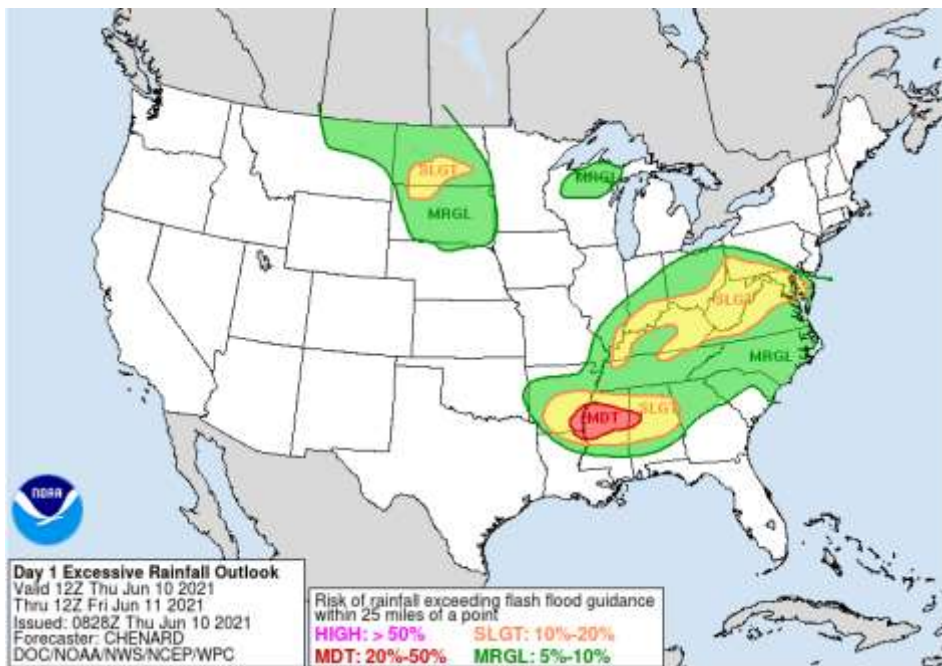
Indianapolis, Indiana








Outlook, Watch and Warning

When to Prepare, When to take Action

- **WPC Outlook** - Issued days in advance – “Heads Up”
 - General awareness of heavy rain and flash flooding potential and trends
 - WPC issues Excessive Rain Outlook (ERO) for entire country



Weather Prediction Center Excessive Rain Outlooks Issued for Days 1-7

Understanding WPC Excessive Rainfall Risk Categories				
No Area/Label	MARGINAL (MRGL)	SLIGHT (SLGT)	MODERATE (MDT)	HIGH (HIGH)
Flash floods are generally not expected.	Isolated flash floods possible	Scattered flash floods possible	Numerous flash floods likely	Widespread flash floods expected
@NWSWPC	Localized and primarily affecting places that can experience rapid runoff with heavy rainfall.	Mainly localized. Most vulnerable are urban areas, roads, small streams and washes. Isolated significant flash floods possible.	Numerous flash flooding events with significant events possible. Many streams may flood, potentially affecting larger rivers.	Severe, widespread flash flooding. Areas that don't normally experience flash flooding, could. Lives and property in greater danger.
Flash flooding near me?	Flash Flooding	Flash Flooding	Flash Flooding	Flash Flooding
	NO Flash Flooding	Flash Flooding	Flash Flooding	Flash Flooding
 WEATHER PREDICTION CENTER				





Outlook, Watch and Warning

When to Prepare, When to take Action

- **Local Outlook** - Issued around 4 am and 4 pm daily
 - General awareness of local storm potential and trends
 - Text and graphics issued and updated by local NWS office

Hazard Risks							
24 Hr Hazard	Day 1	Fri	Sat	Sun	Mon	Tue	Wed
Excessive Cold	■	■	■	■	■	■	■
Excessive Heat	■	■	■	■	■	■	■
Fire Weather	■	■	■	■	■	■	■
Excessive Rainfall	■	■	■	■	■	■	■
Fog	■	■	■	■	■	■	■
Hail	■						
Lightning	■	■	■	■	■	■	■
NonThunderstorm Wind	■	■	■	■	■	■	■
Ice Accumulation	■	■	■	■	■	■	■
Snow Sleet	■	■	■	■	■	■	■
Spotter Outlook	■						
Severe Thunderstorms	■	■	■	■	■	■	■
Thunderstorm Wind	■						
Tornado	■						





Outlook, Watch and Warning

When to Prepare, When to take Action

- **Watch** - Covers large areas and usually issued "hours" ahead of severe weather
- **Warning** - Covers small areas and usually issued "minutes" ahead of severe weather

WATCH VS. WARNING
Do YOU know the difference?

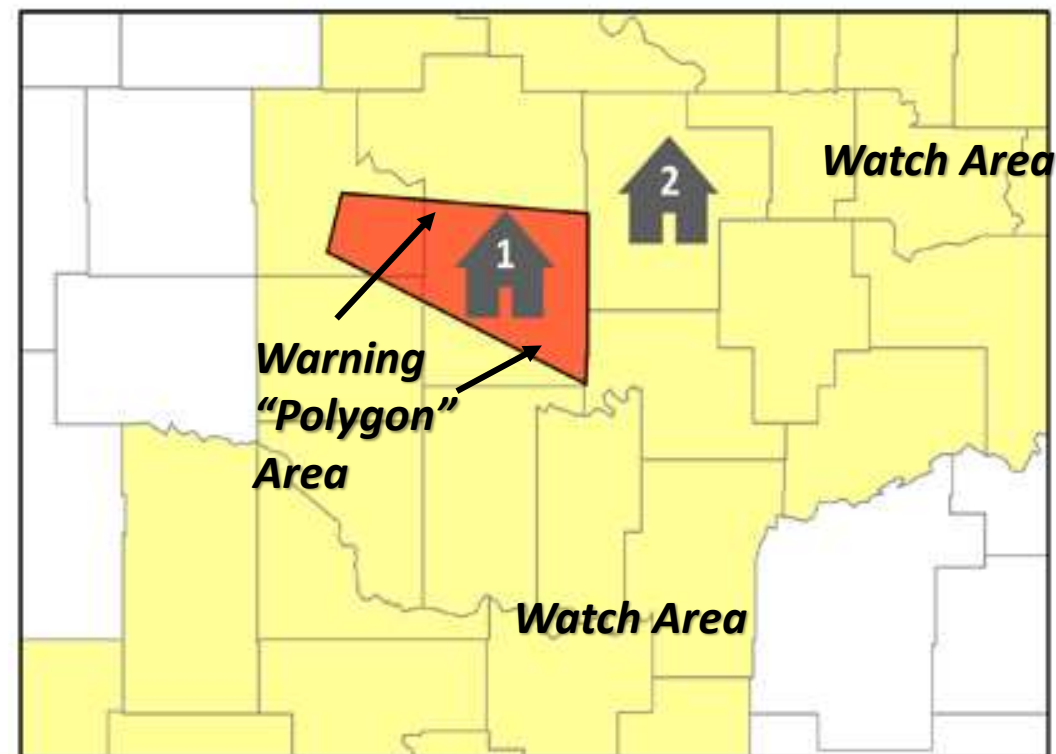
WATCH
BE ALERT. Severe storms or tornadoes **MIGHT** form and affect your area.

WARNING
TAKE ACTION! A severe storm or tornado is **expected** in your area.

You should be...

Monitoring Information
Keep an eye on the sky

ACT IMMEDIATELY. GET IN, GET DOWN, AND COVER UP.





Severe Warning Criteria

Severe Thunderstorm Warning

- Thunderstorm wind gusts ≥ 58 mph & or:
- Hail ≥ 1 inch in diameter



Tornado Warning

- Doppler Radar indicated rotation
- Confirmed reports of a tornado



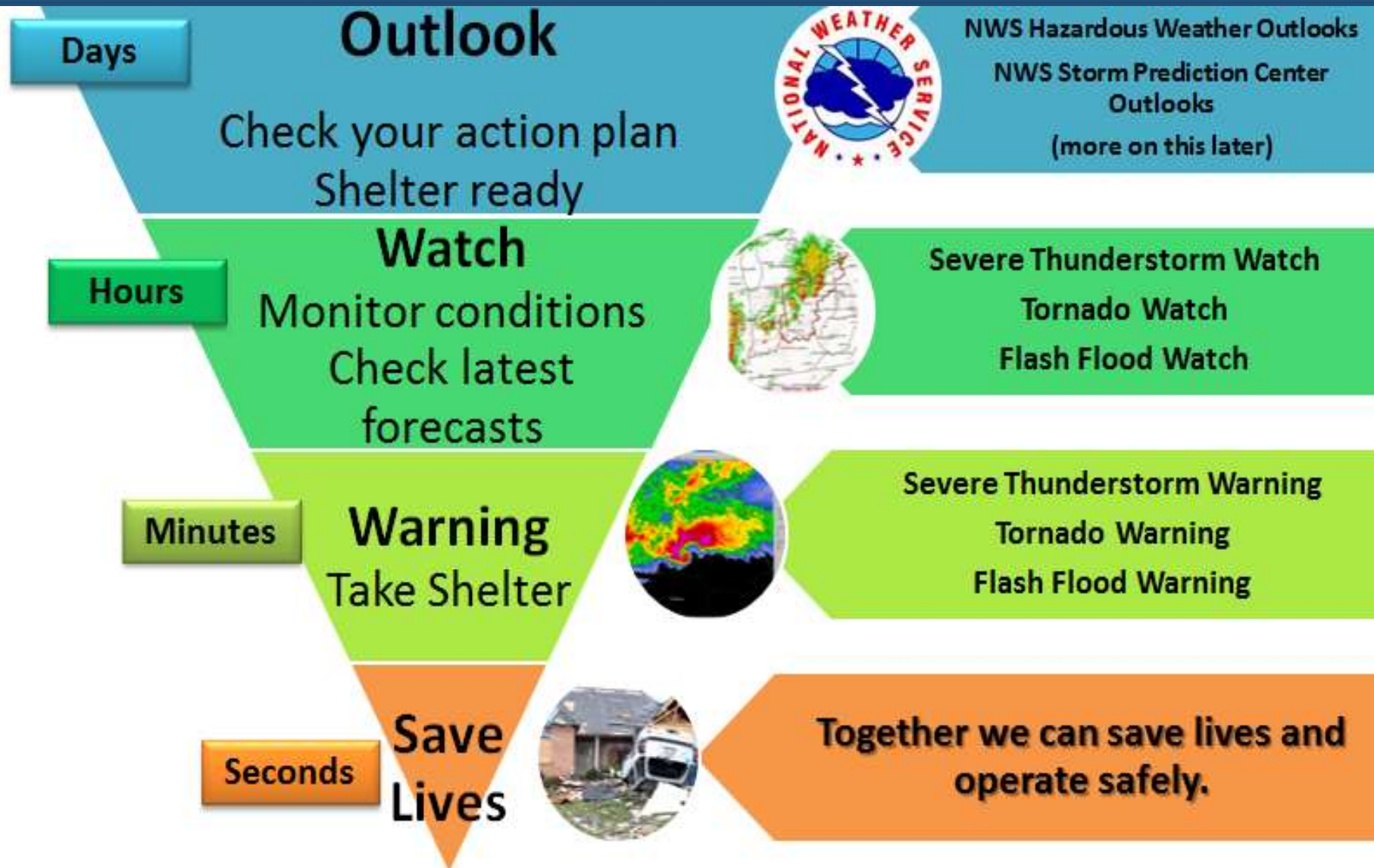
Flash Flood Warning

- 6 inches or more of flowing water over roadways
- A rapid rise in water that is a threat to life & property





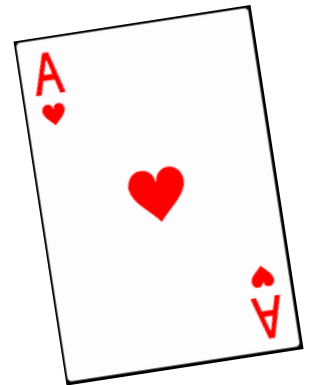
Preparedness and Actions





Remember 'ACES' for Personal Safety

- **AWARENESS** - Remain aware of your surroundings at all times. Includes changing weather conditions as well as physical structures and roads
- **COMMUNICATION** - Let others know your location often and have multiple methods to communicate
- **ESCAPE ROUTES** - Know all your possible escape routes
- **SHELTERS** - In case escape routes are unavailable, know where safe zones or shelters are located nearby





Tornado and Thunderstorm Safety



Personal safety is your primary objective!

Shelter in a sturdy building away from windows on the lowest floor, interior room or closet

Cover your head with hands, blanket, pillow, etc.

Mobile home – find a safer building long before storm arrives, preferably when a watch is issued

In vehicle – Drive away; abandon to ditch as last resort





Lightning Safety

Safe Place: INSIDE a fully enclosed building with plumbing or wiring

Automobile is next safest place

Outdoors: DANGEROUS

When Thunder Roars, Go Indoors Immediately



When Thunder Roars Go Indoors!

STOP Activities

Seek shelter immediately in a substantial building or a hard-topped metal vehicle!



www.lightningsafety.noaa.gov



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Indianapolis, Indiana



Flash Flooding Safety



Turn Around, Don't Drown!

Flash flooding is particularly dangerous at night

Flooding causes more fatalities each year than any other thunderstorm hazard

More than half of all flood-related drownings involve a vehicle



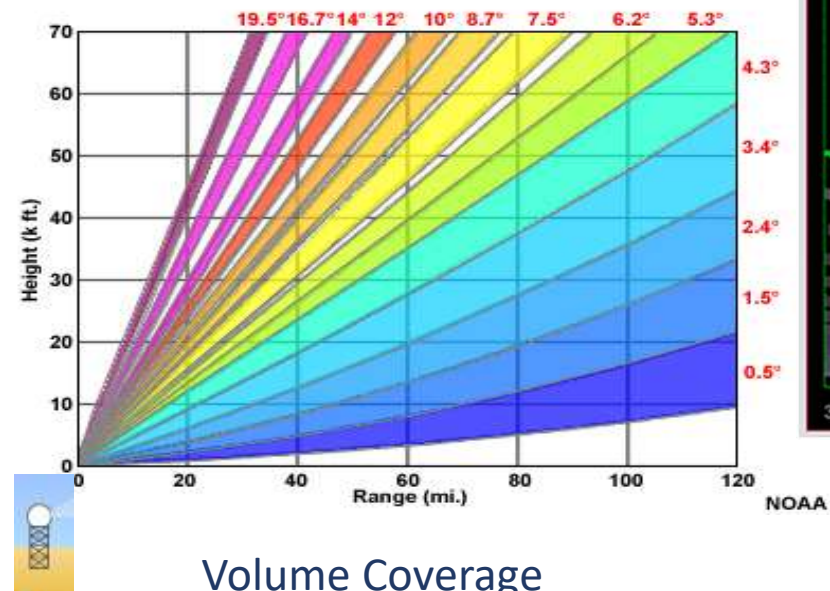


Basic Meteorology for Spotters

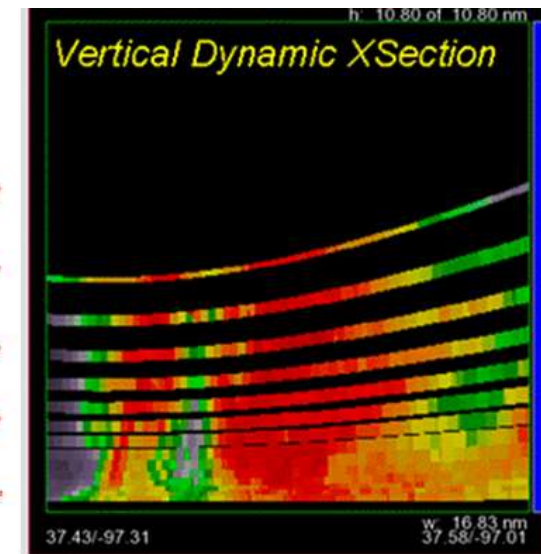




WSR-88D Basic Operations



Volume Coverage

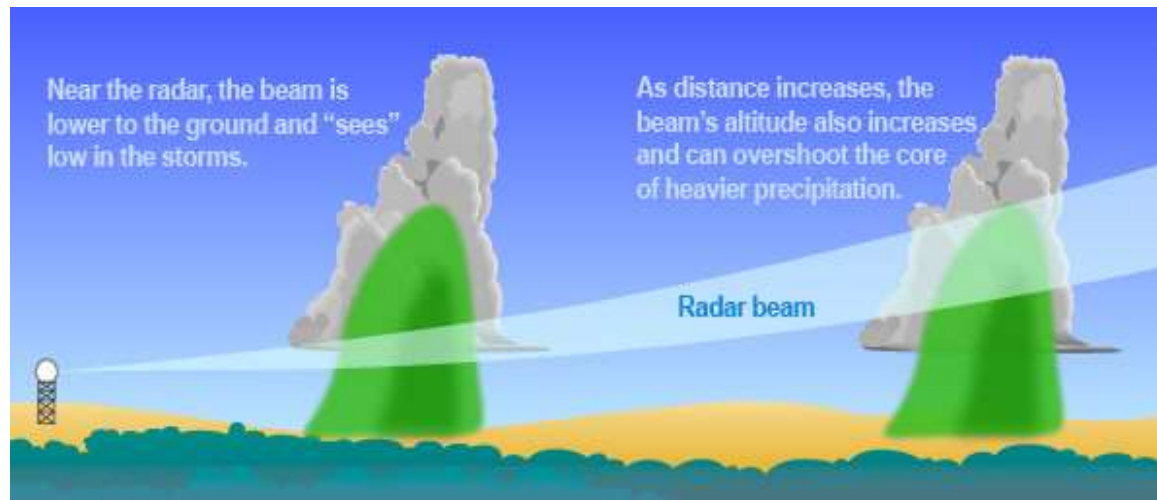




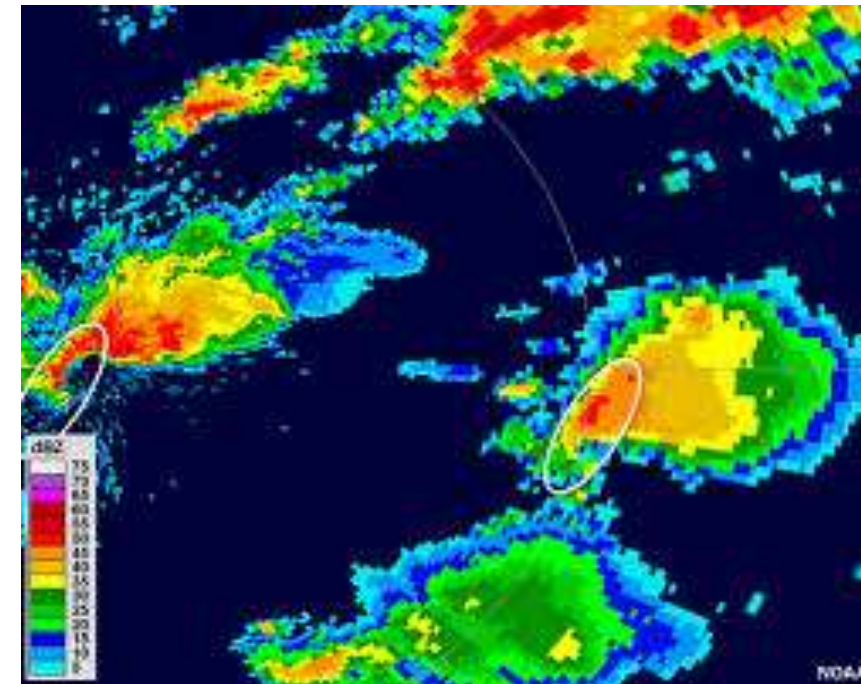
WSR-88D Limitations

This is One Reason Why Spotters are Important!

Radar

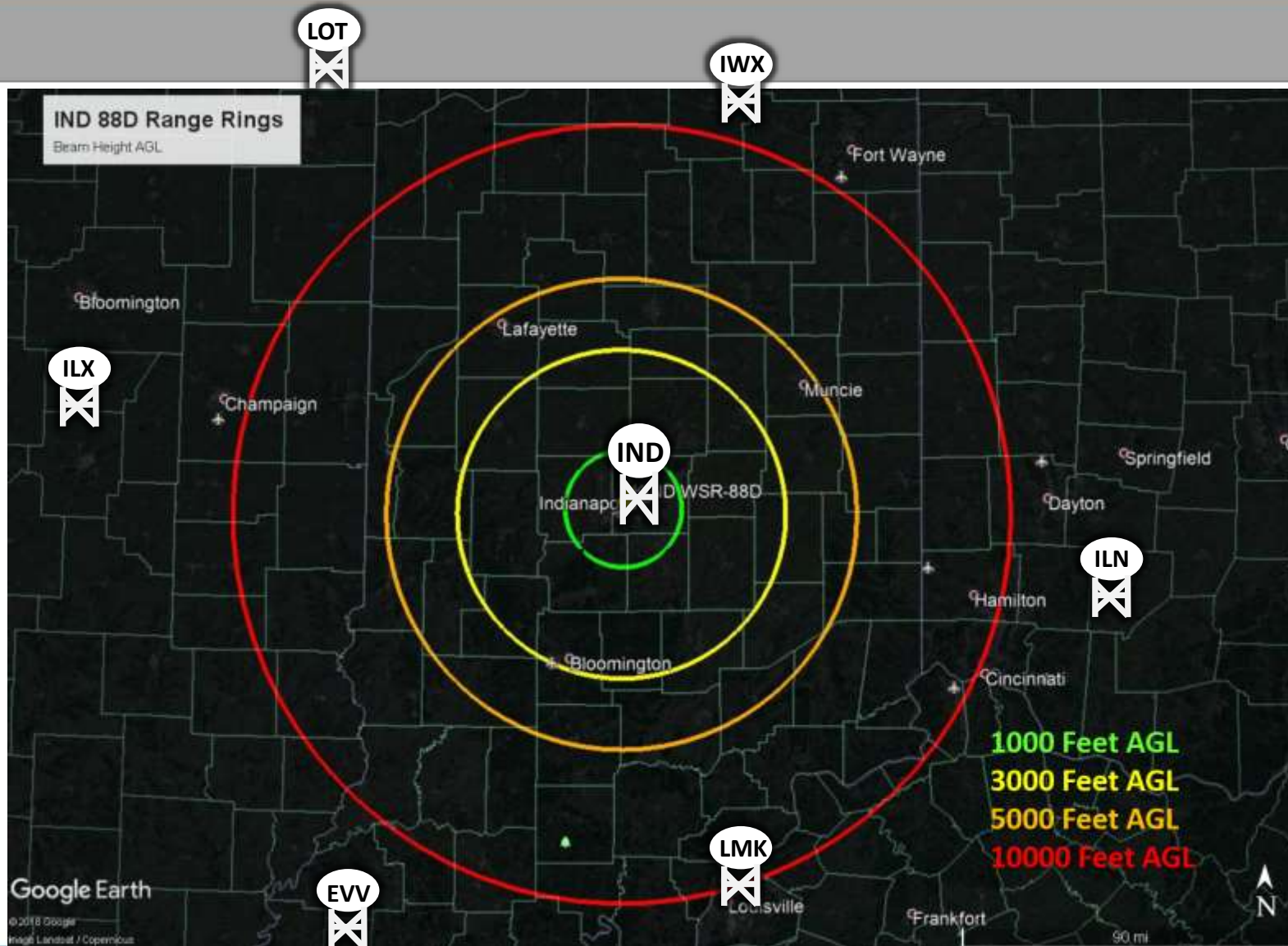


...but as the beam gets further away from the radar, the beam is scanning higher up in the atmosphere, which can **"overshoot"** the important parts of storms





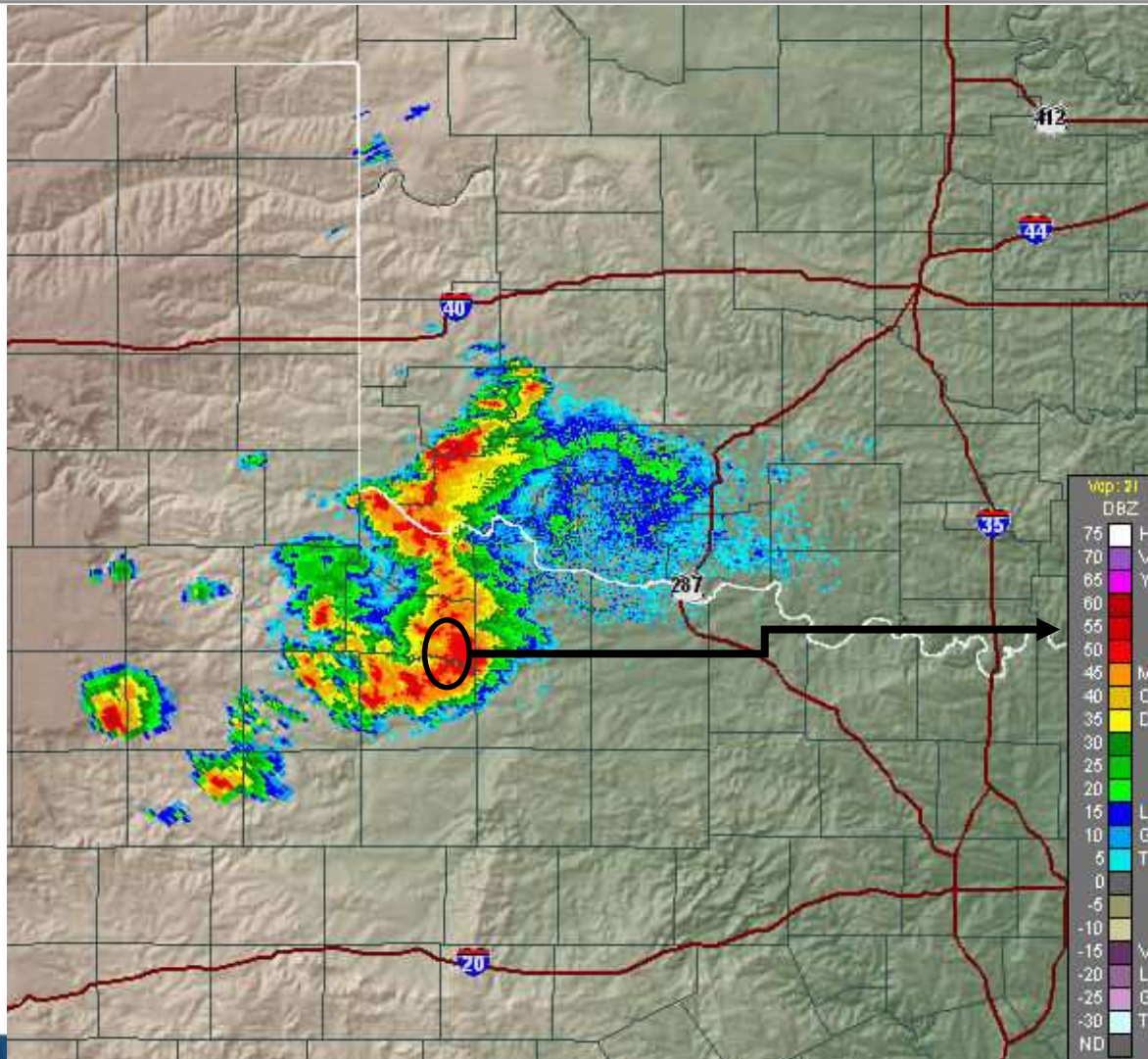
Radar Coverage for Central Indiana





Basic Radar Display

Base Reflectivity (BR) – Precipitation “Intensity”



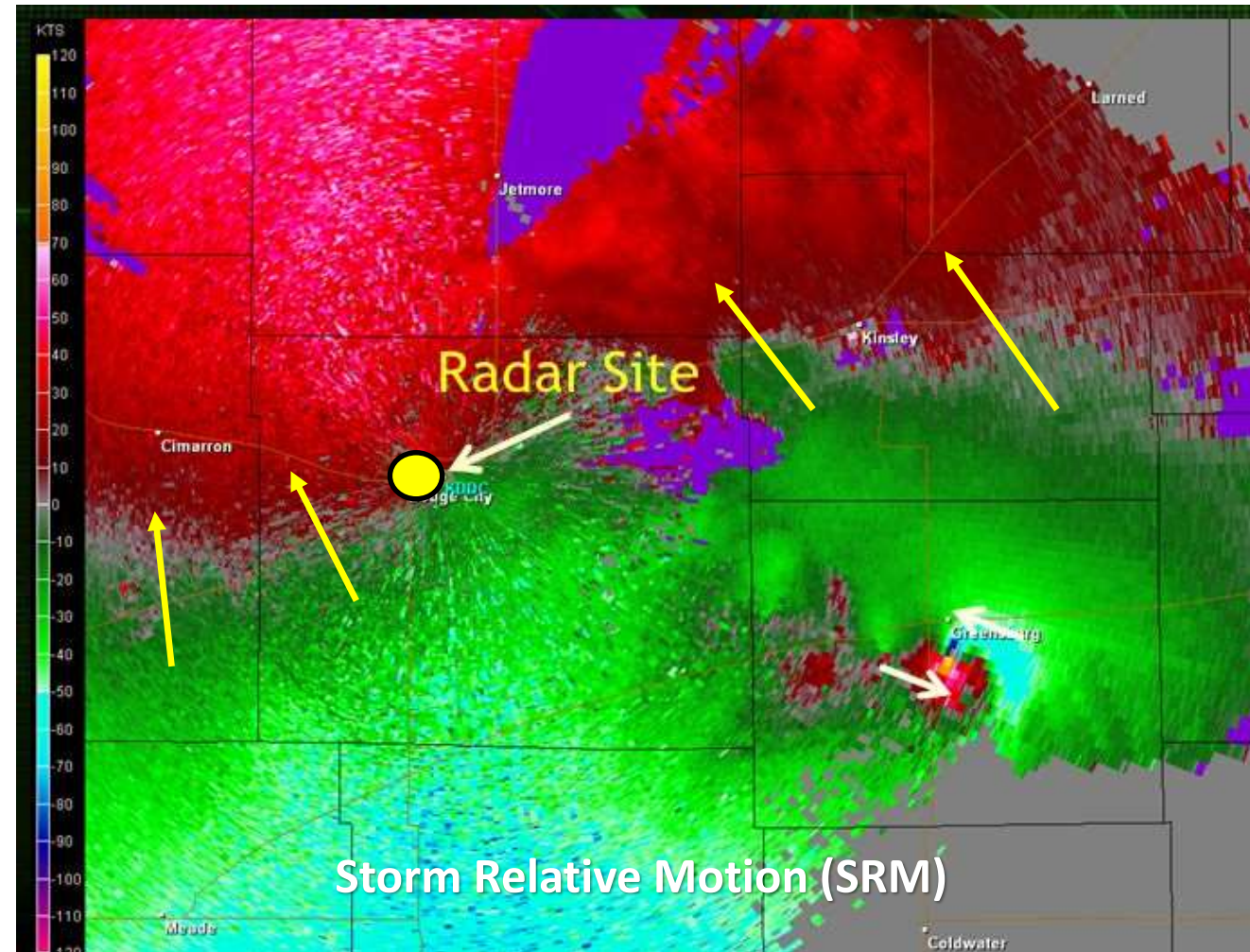
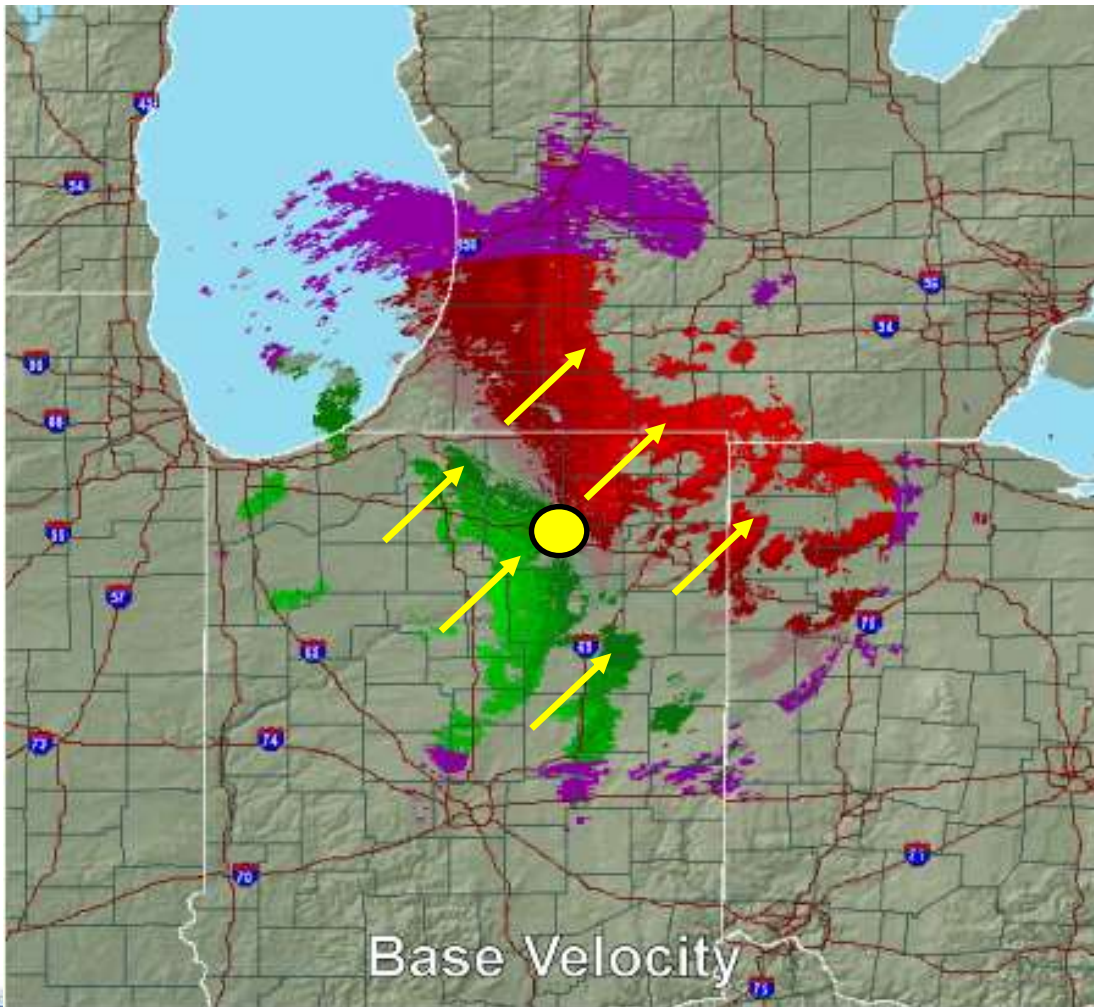
dBZ	Rain Rate (in/hr)
65	16+
60	8.00
55	4.00
50	1.90
45	0.92
40	0.45
35	0.22
30	0.10
25	0.05
20	0.01
< 15	No rain





Basic Radar Display

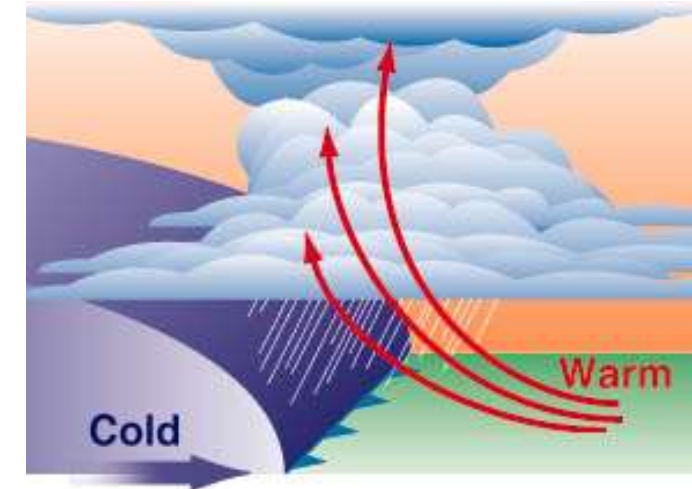
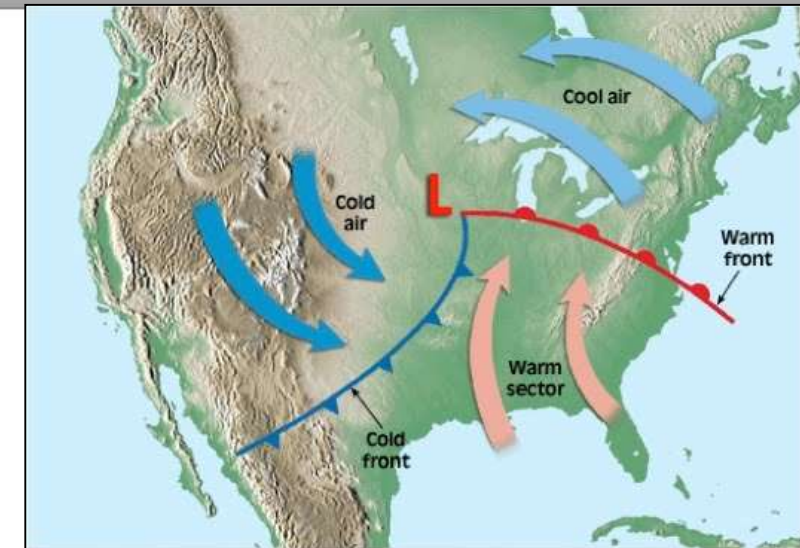
Base Velocity (BV) and Storm Relative Motion (SRM)





Thunderstorm Ingredients

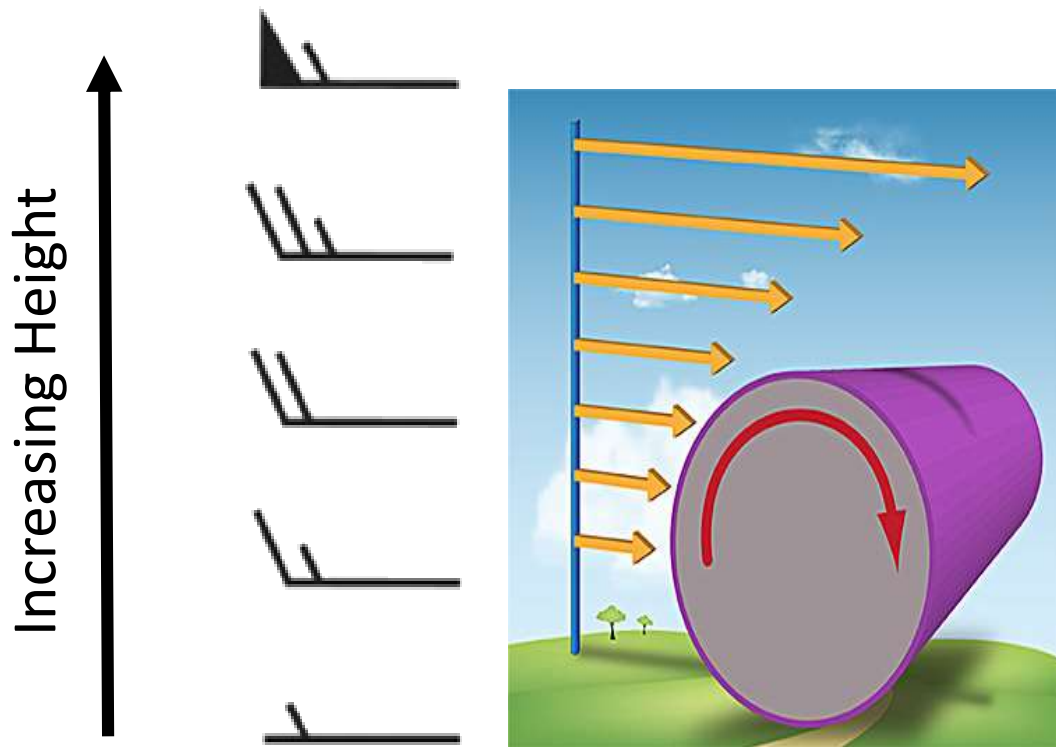
- For General Thunderstorms to Develop:
 - Warm, moist air at the surface. Cooler, drier air aloft
 - This makes the atmosphere UNSTABLE and air will more easily rise on its own or after being lifted
 - Surface dew points are a measure of moisture
 - Lifting mechanism or “Trigger”
 - Warm/cold fronts, outflow boundaries from other storms, jet stream, terrain
- For SEVERE Thunderstorms to Develop:
 - WIND SHEAR is Needed!
 - Speed and Directional shear help determine storm type



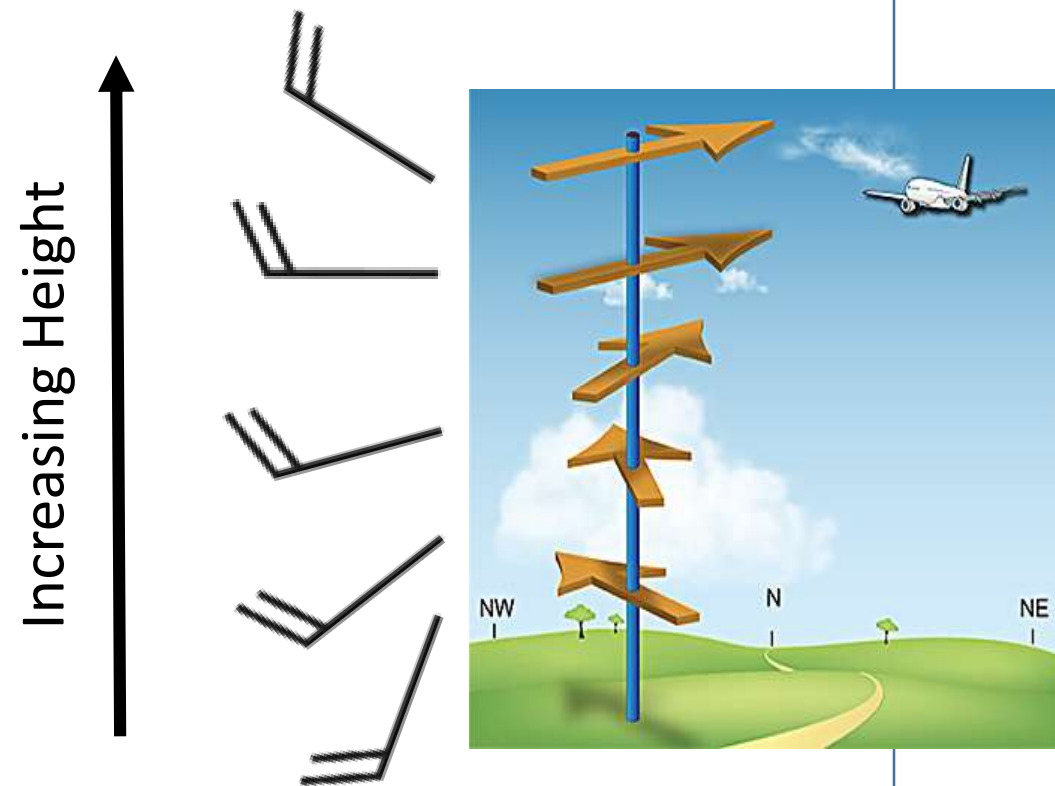


The Role of Wind Shear

Speed Shear

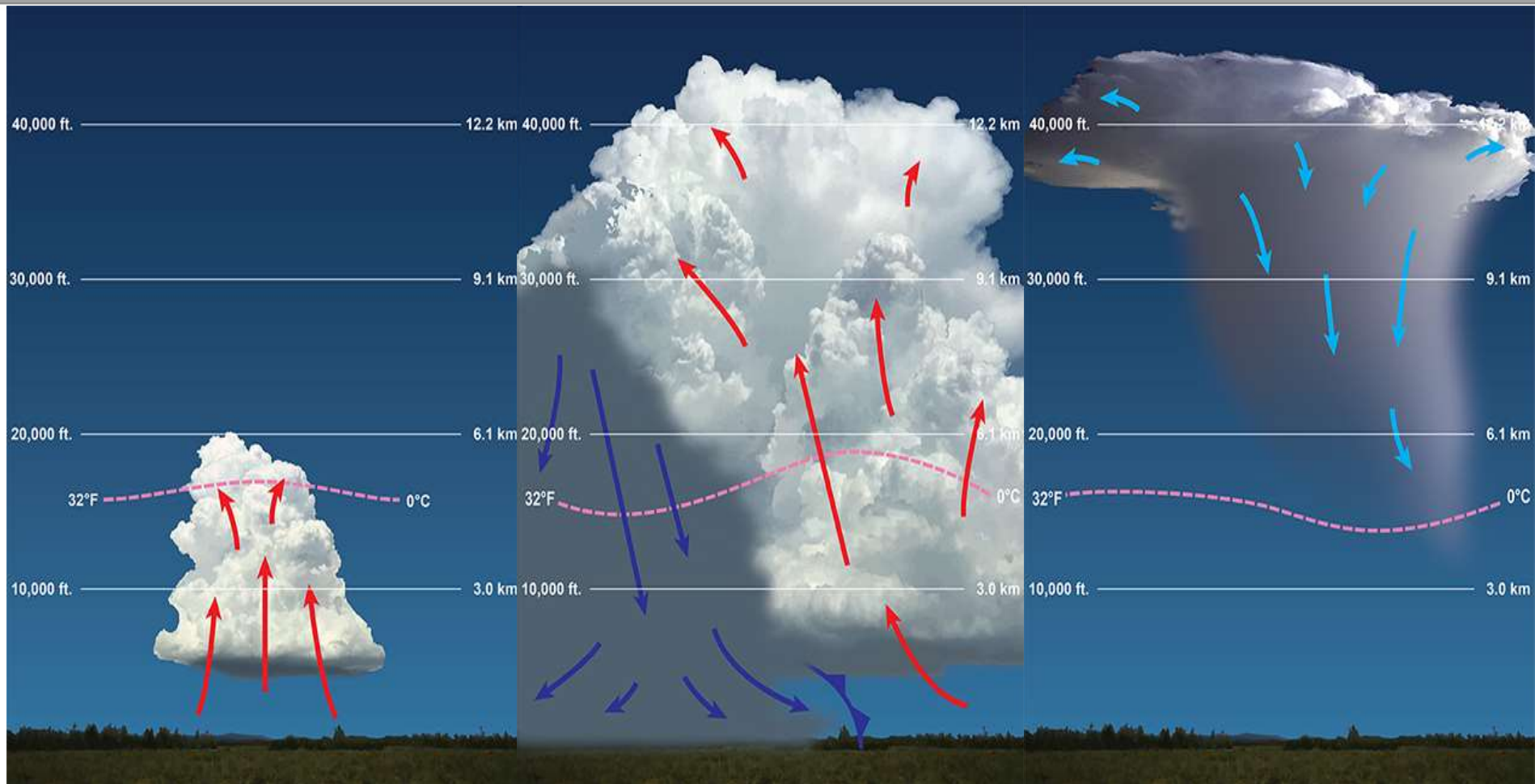


Directional Shear





Basic Thunderstorm Life Cycle



Cumulus

Mature

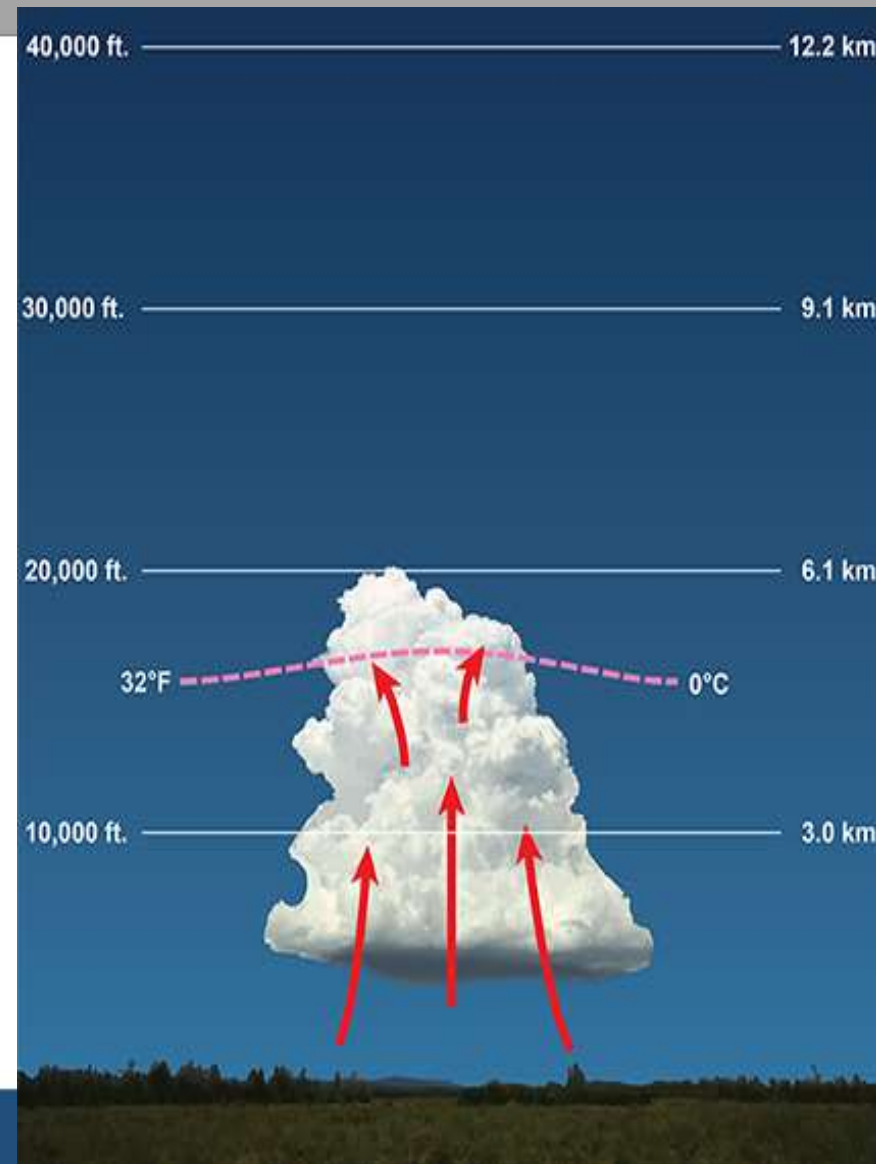
Dissipating





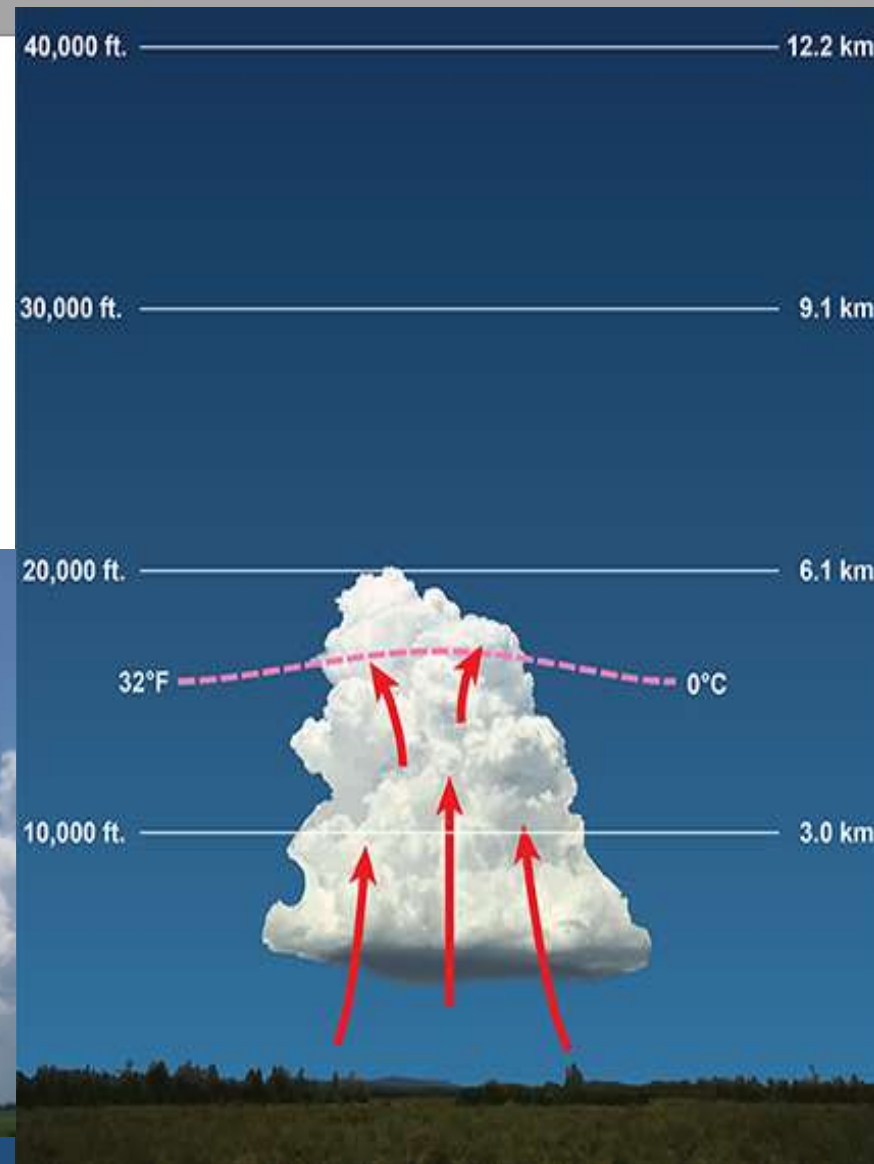
Towering Cumulus Stage

- Updraft dominant
- Downdraft not present
- Air condensing while rising
- Cumulus tops can reach 20,000 ft
- Precipitation held aloft by updraft





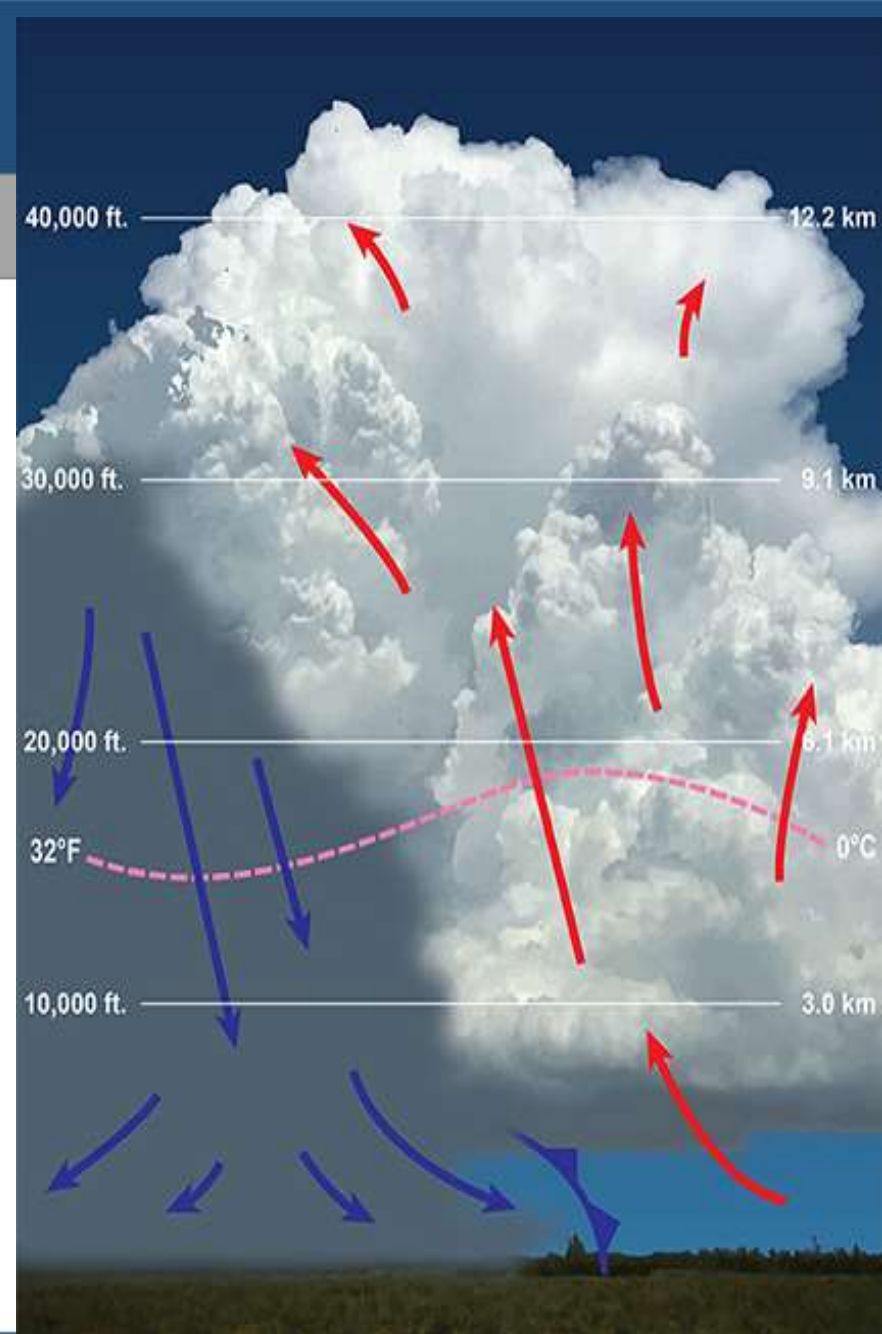
Towering Cumulus Stage





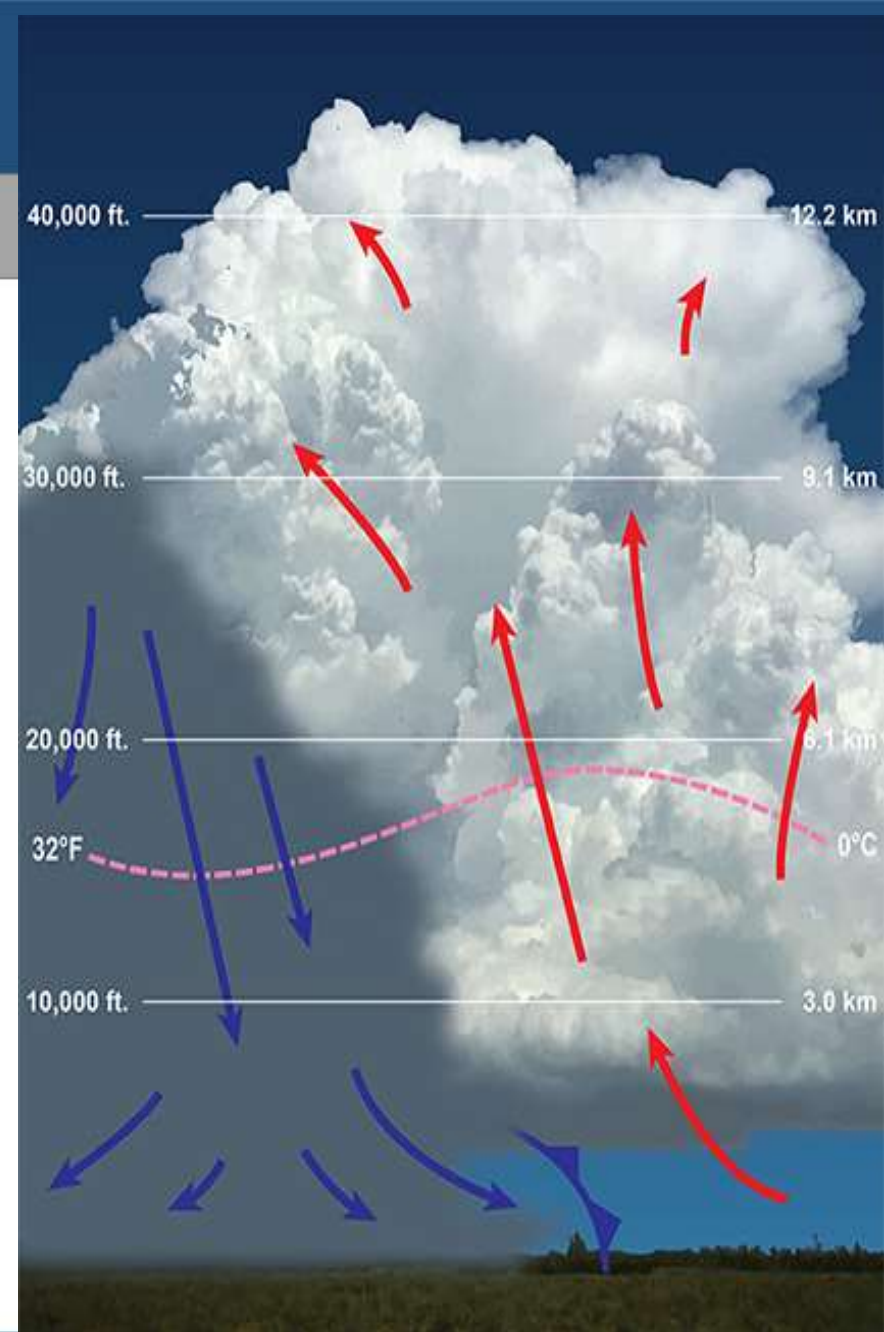
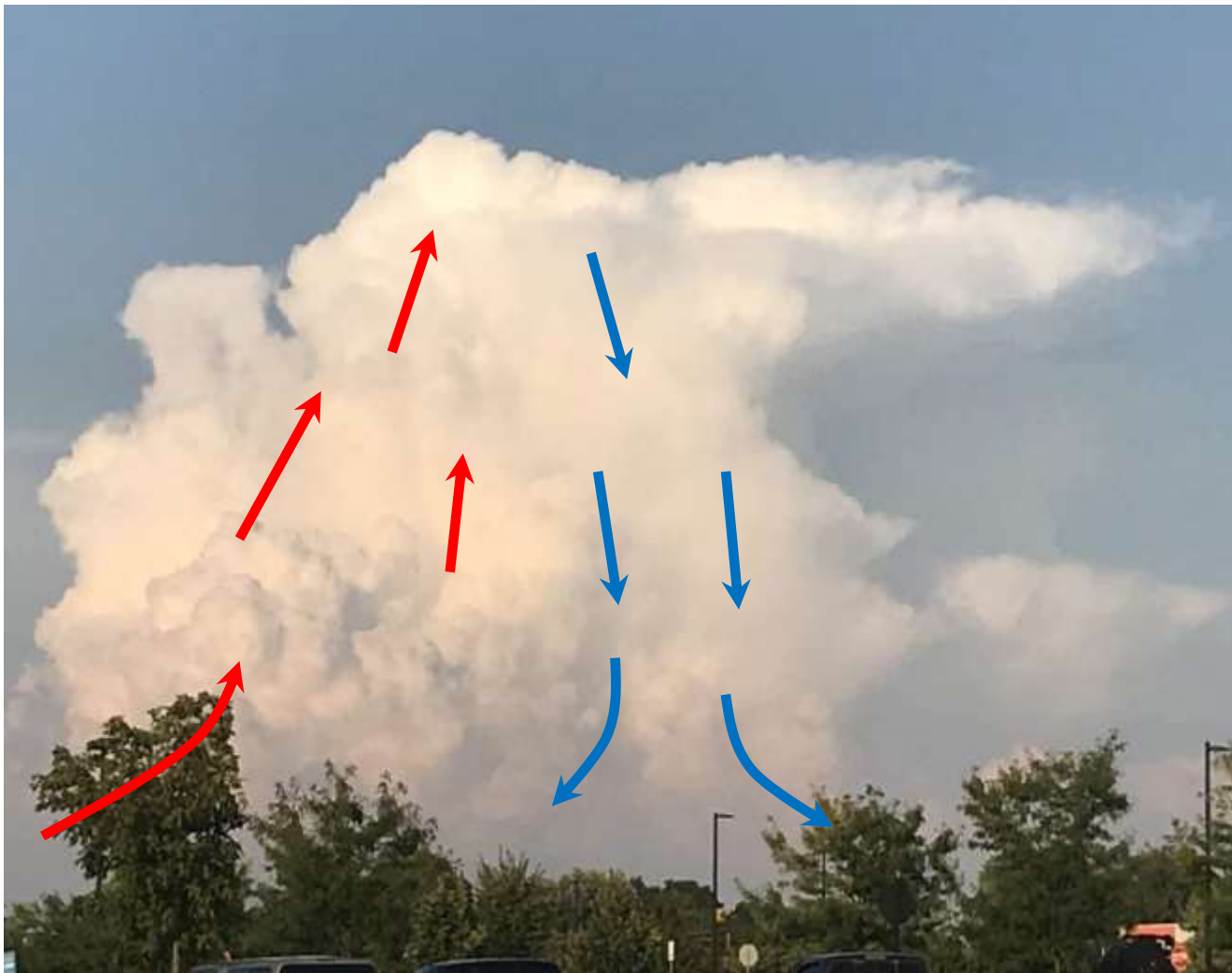
Mature Stage

- Distinct updraft and downdraft
- Large, cauliflower looking clouds
- Raindrops become large enough to reach the ground
- Development of a cold pool and gust front
- Severe weather most likely at this stage





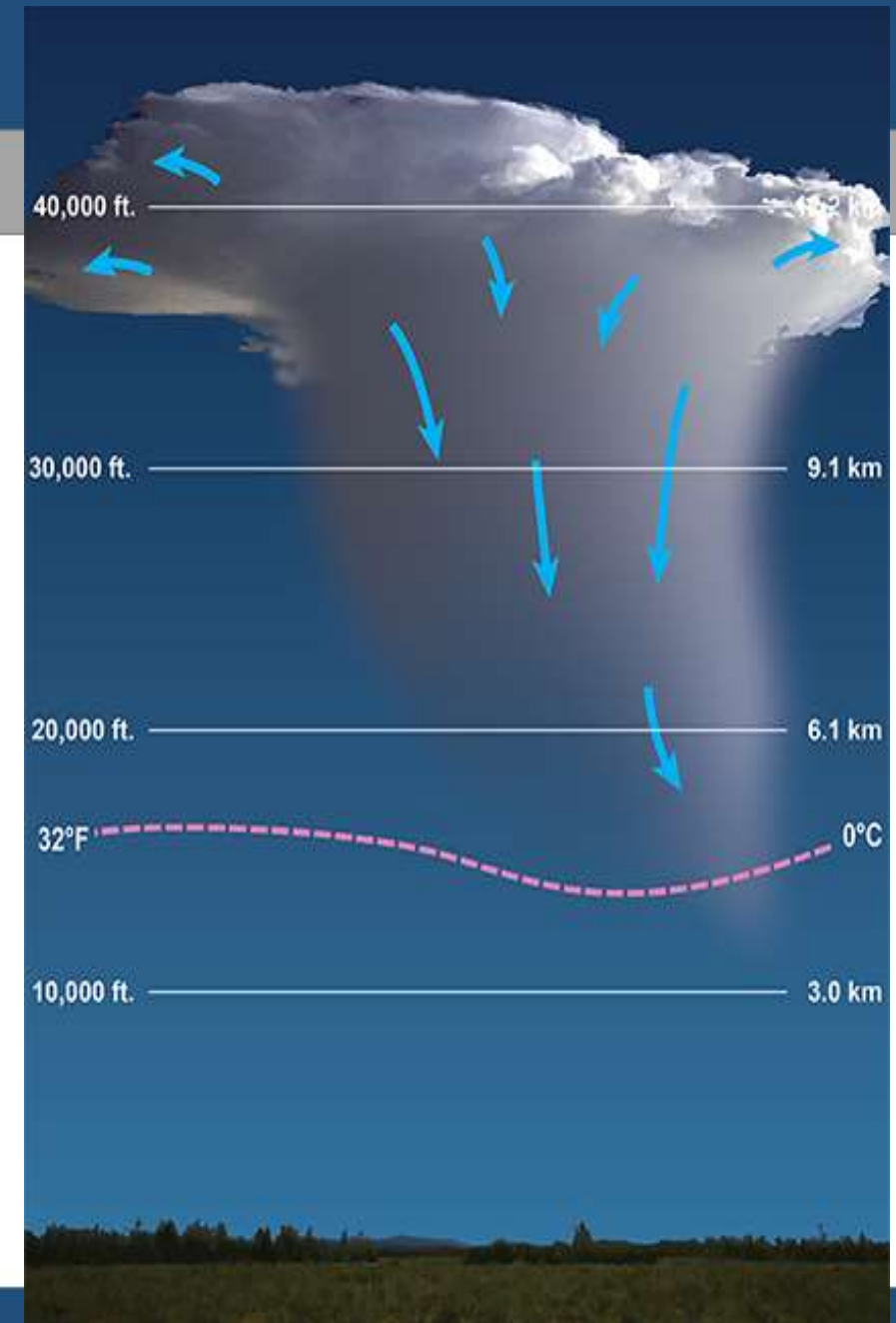
Mature Stage





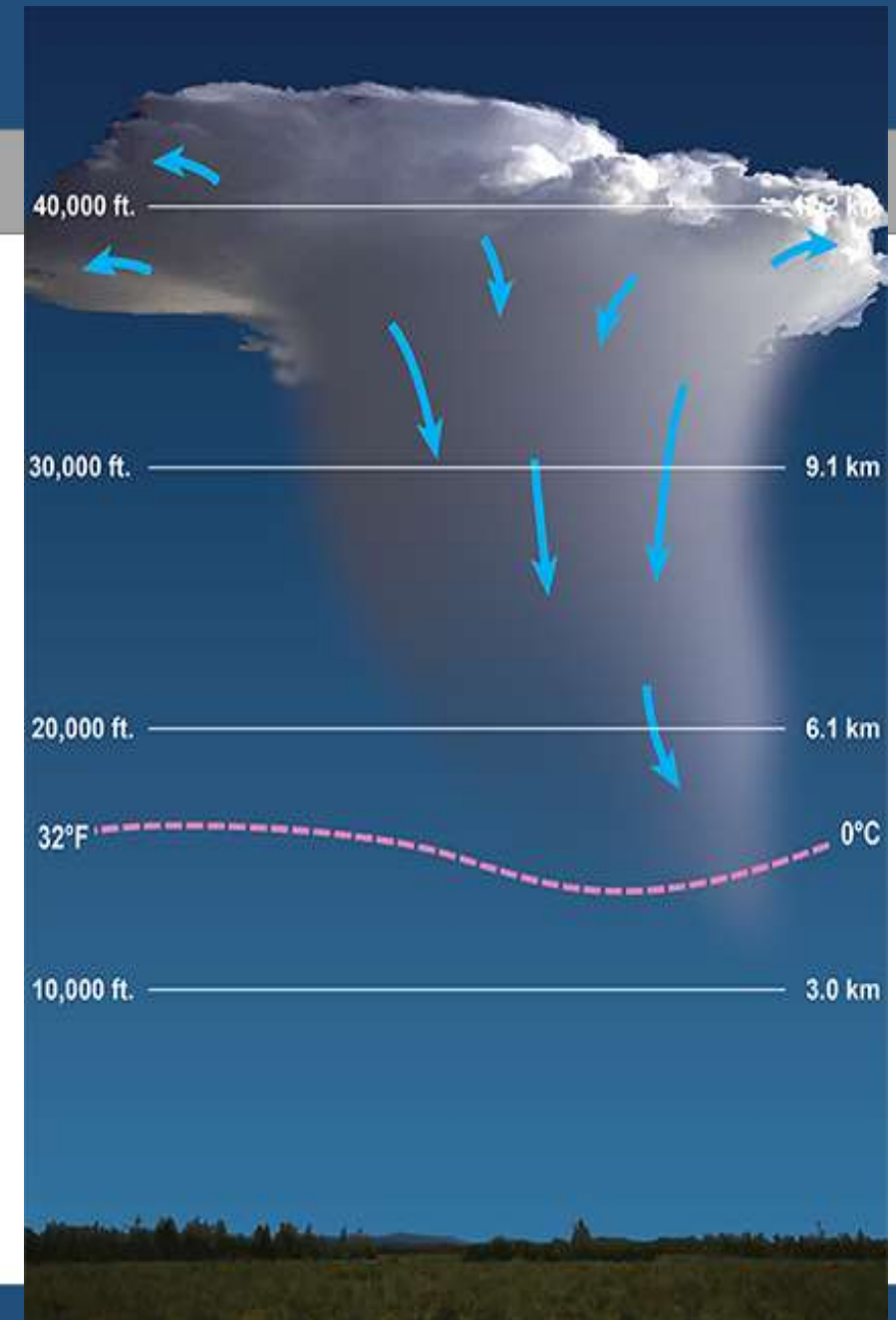
Dissipating Stage

- Updraft doesn't exist, or is weak
- Thunderstorm will fizzle out
- Brief downburst possible at beginning of this phase, otherwise no severe weather
- Total average timeline: Cumulus to Dissipation – 30 to 60 min





Dissipating Stage





The Role of Wind Shear



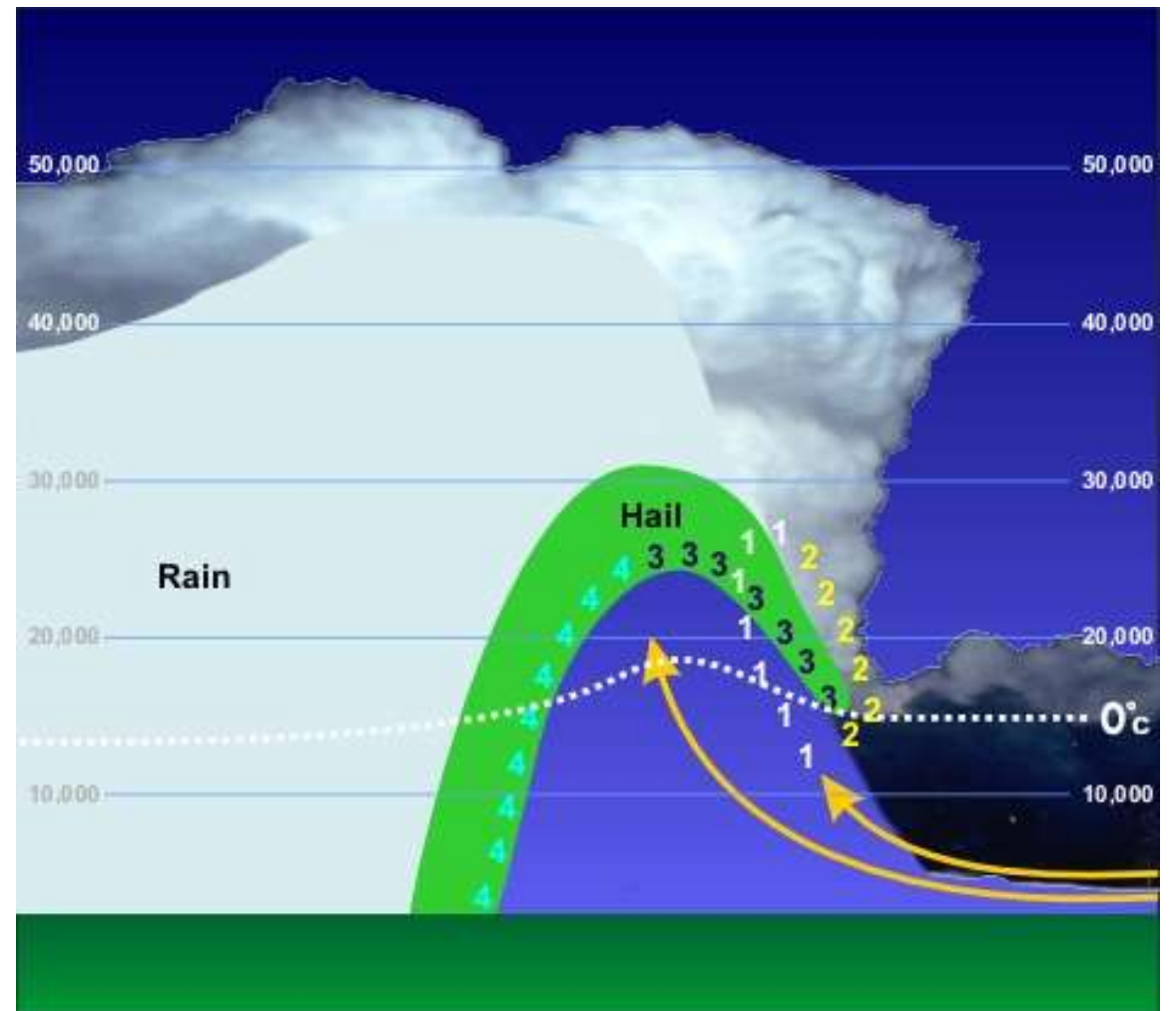
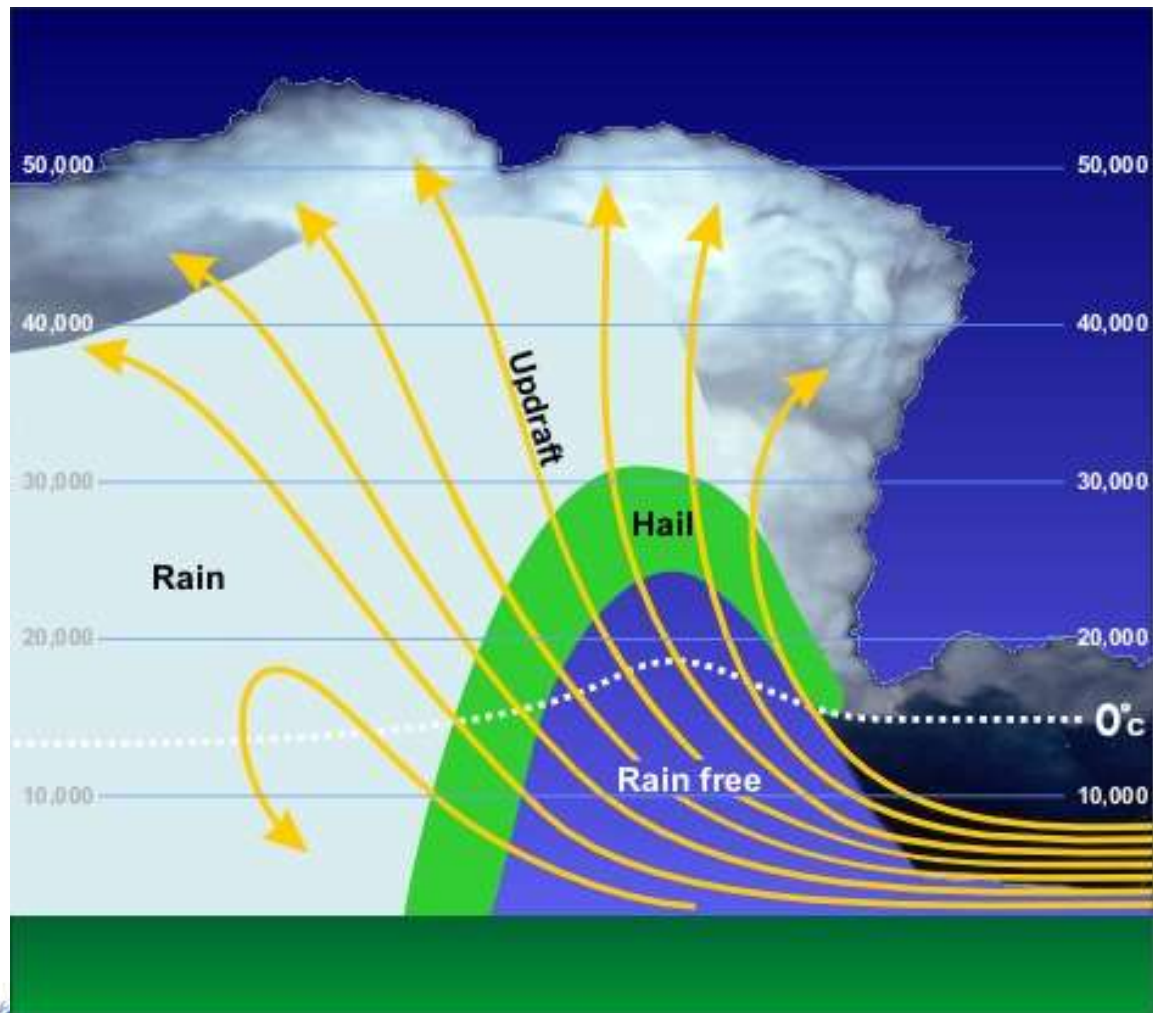
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Indianapolis, Indiana

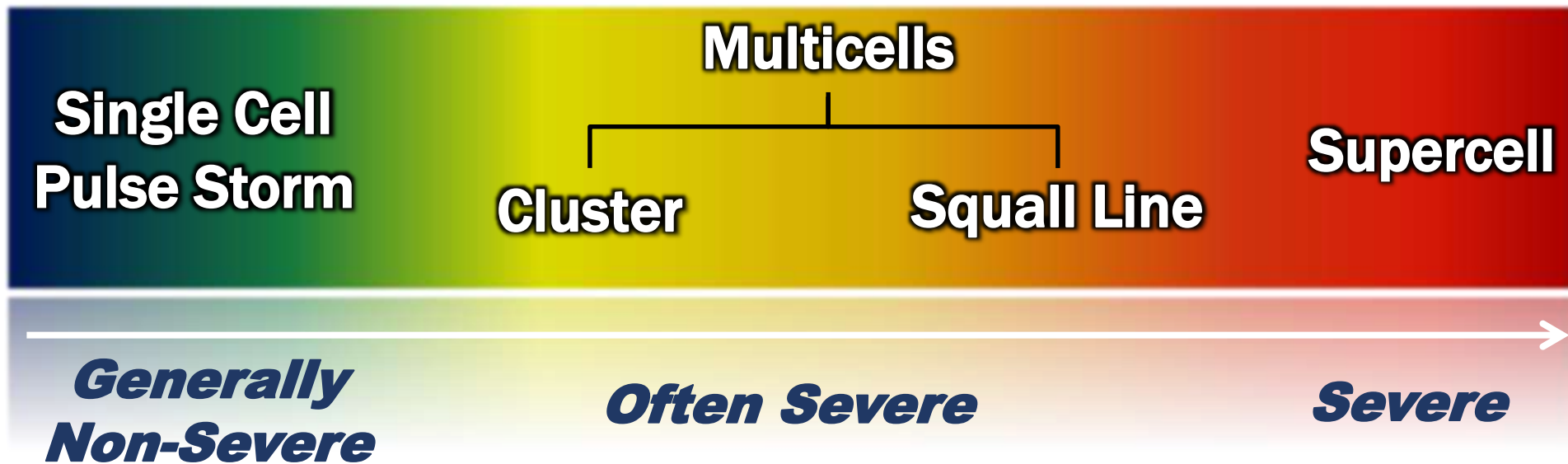


How Does Hail Form?





Thunderstorm Types



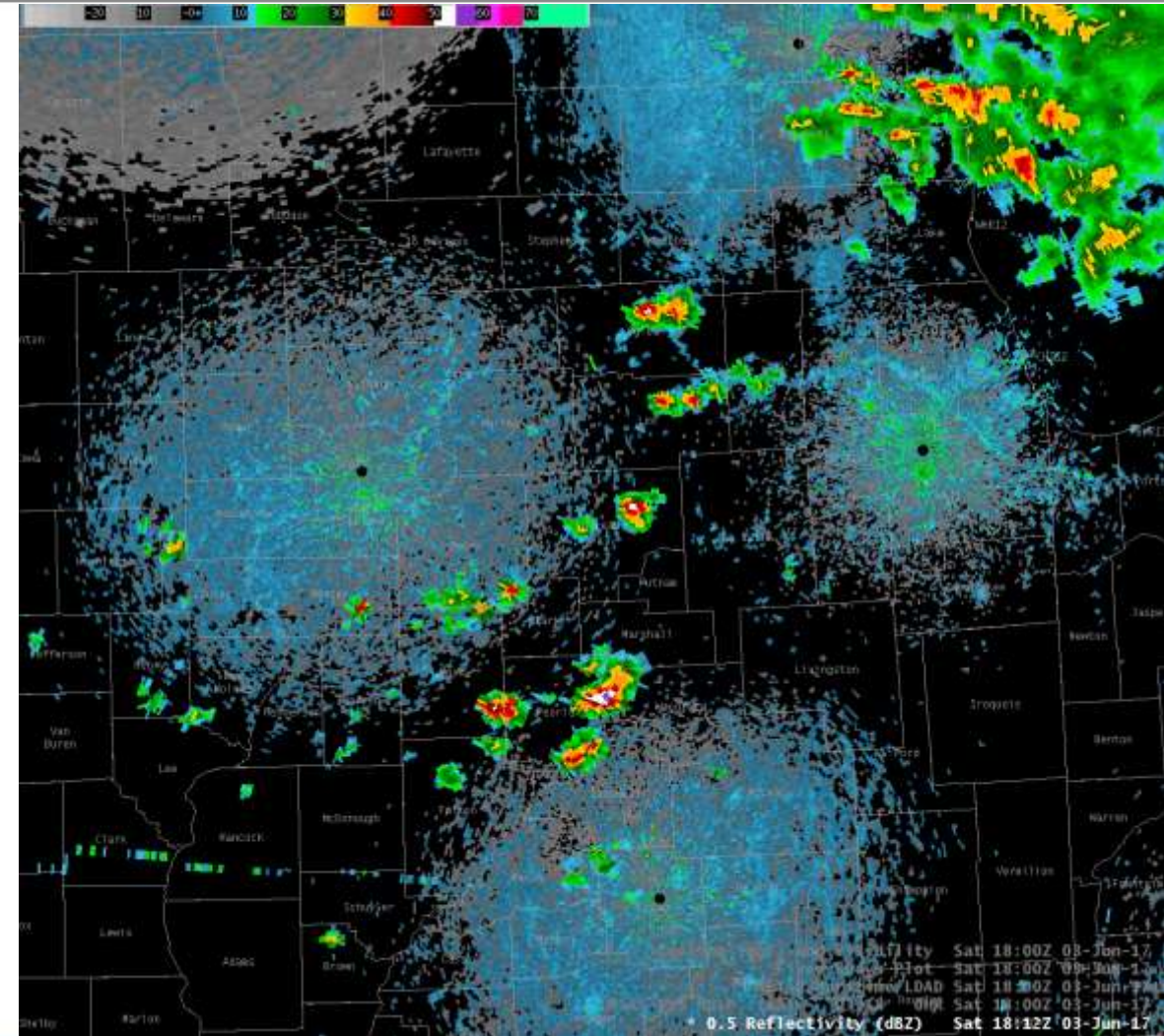
- Storms don't always fit into these exact types
- Can change type one or more times during their existence
 - Atmospheric conditions will determine type of storm





Single Cell or “Pulse” Storms

- Can have many storms at once
- “Outflow” boundaries possible
- Brief “downbursts” or “Microbursts” possible
- In a few cases, intersecting boundaries and new storms could lead to brief and weak tornadoes





Pulse Storm with Microburst

- An actual Indiana microburst
- Brief winds 50-60 mph
- Torrential rainfall
- Near zero visibility
- Don't confuse this with a tornado!

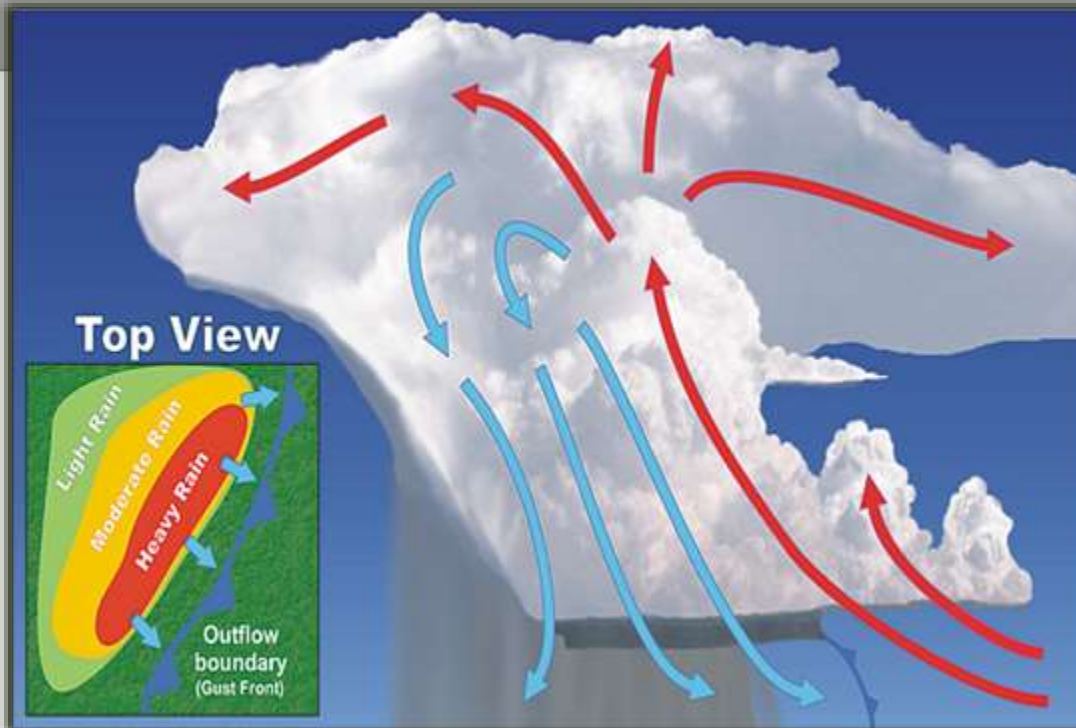
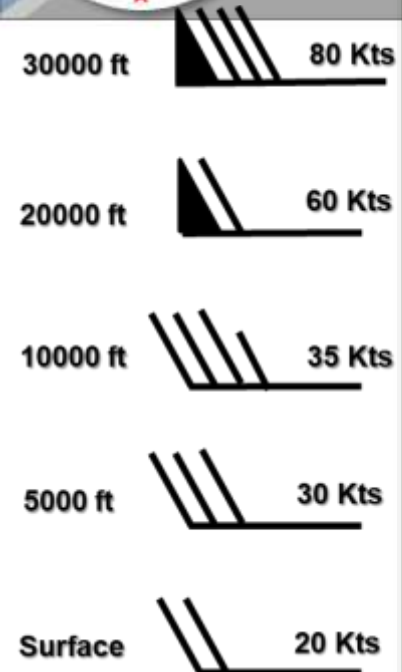


Bob Rich





Multi-cell Thunderstorms



What You May See Coming at You



Overall Severe Weather Threat Level: **Moderate-High**

Hail



Wind



Heavy Rain

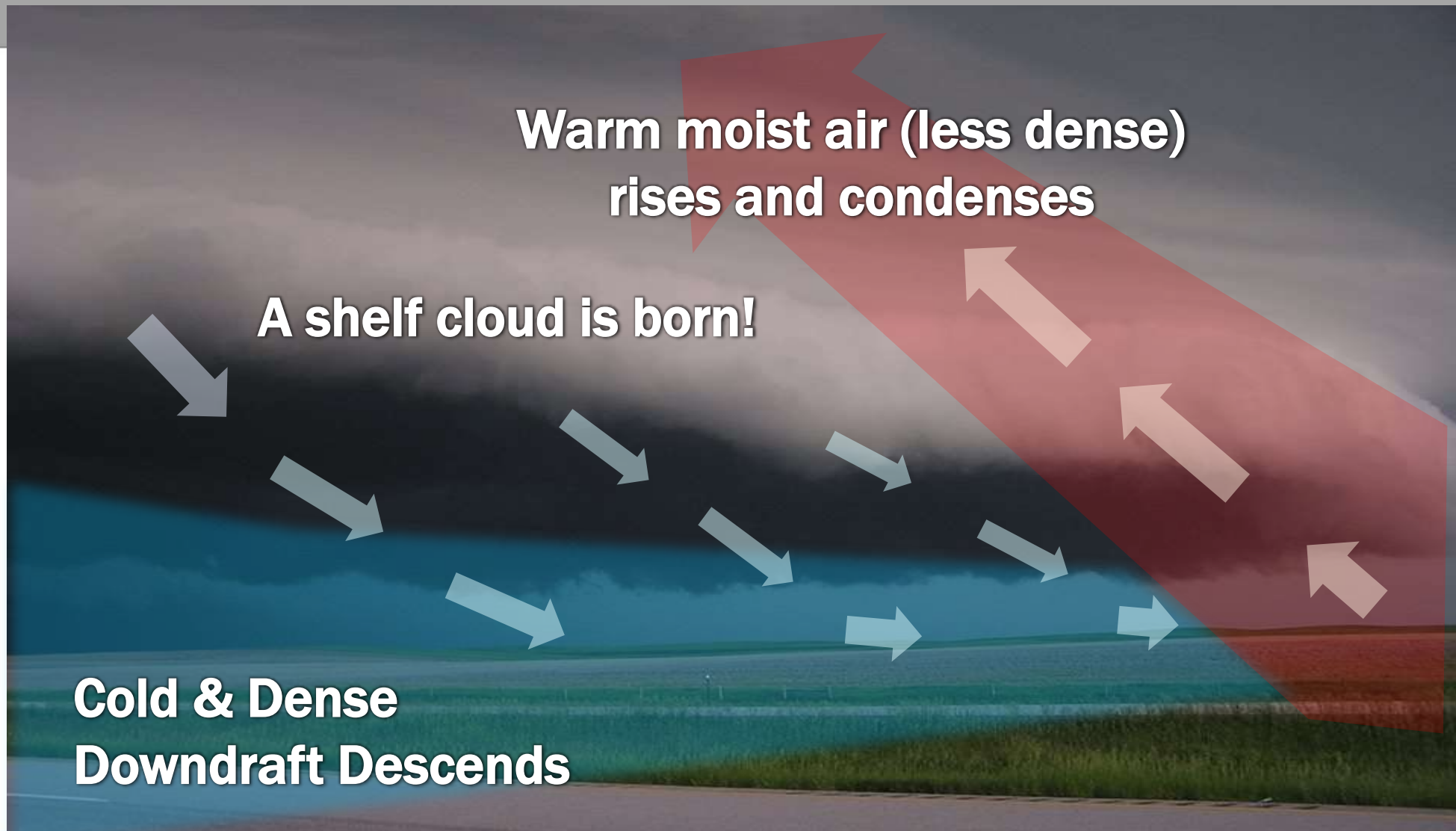


Tornado





Shelf Clouds





Shelf Clouds

P.Dunn Monrovia '16



Sam Lashley



Sam Lashley

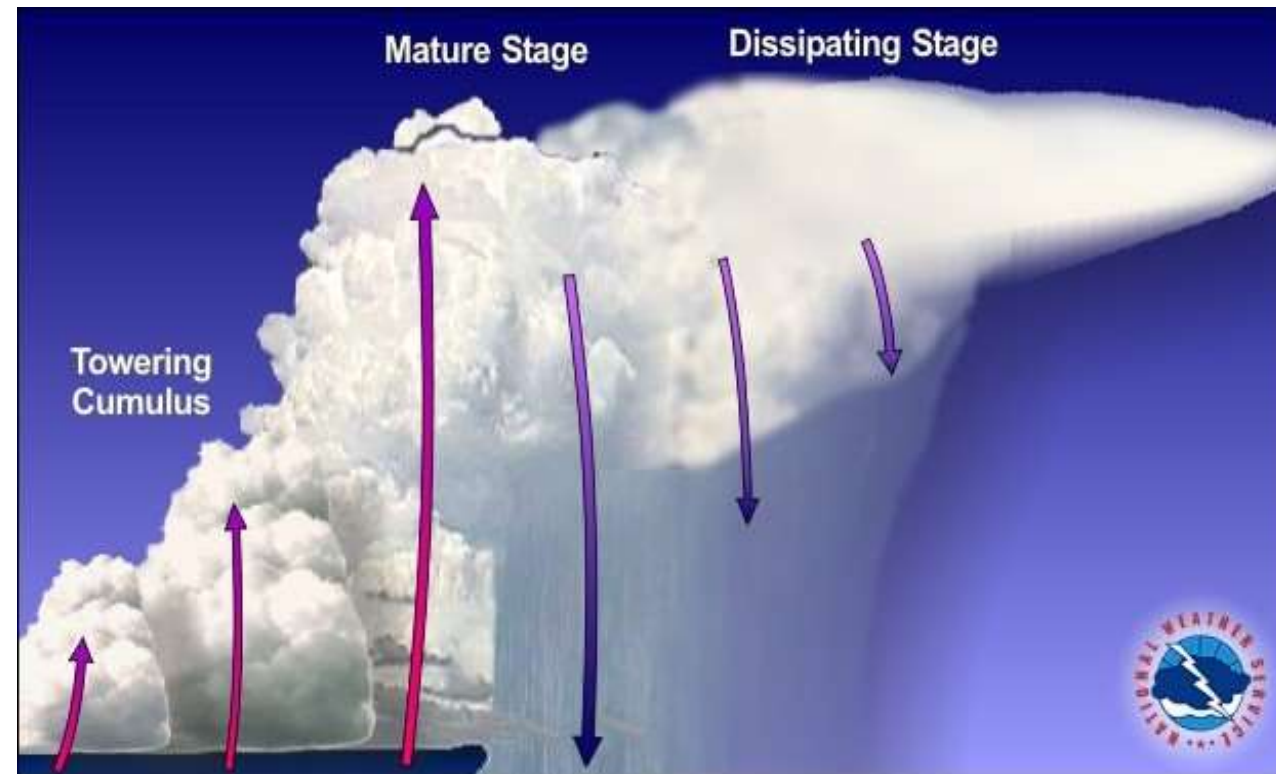




Multi-cell Thunderstorms

Frequently used terms for multi-cell thunderstorms

- Clusters
 - Mesoscale Convective Complex (MCC)
 - Mesoscale Convective System (MCS)
- Line
 - Squall line
 - Quasi Linear Convective System (QLCS)
 - Bow Echo
 - Derecho

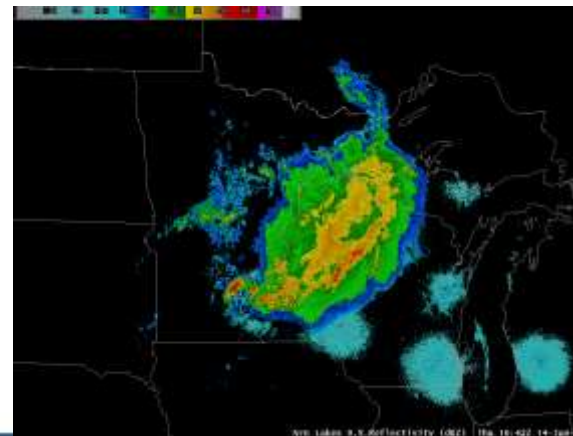
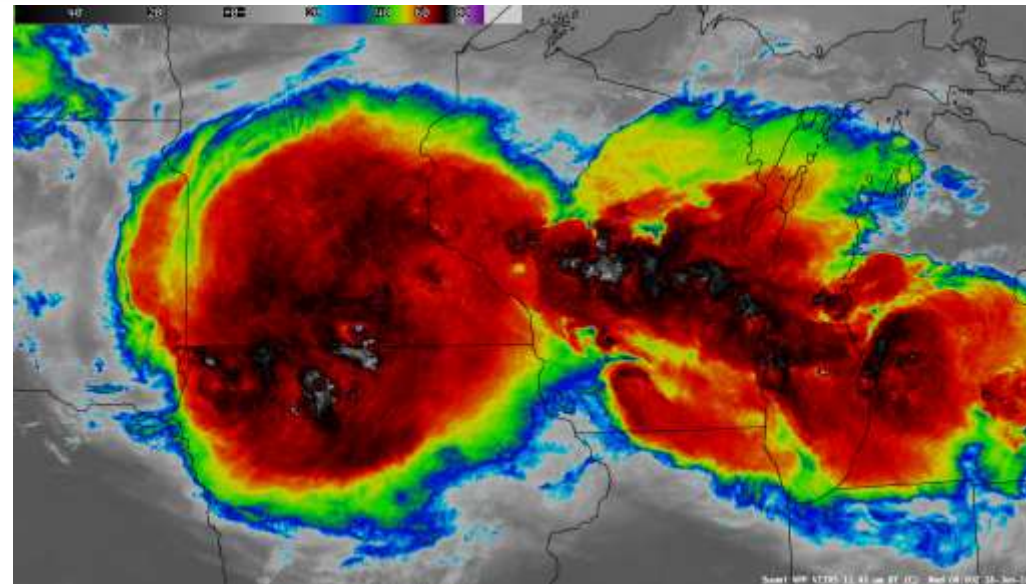




Multi-cell Thunderstorms

MCS or MCC Clusters

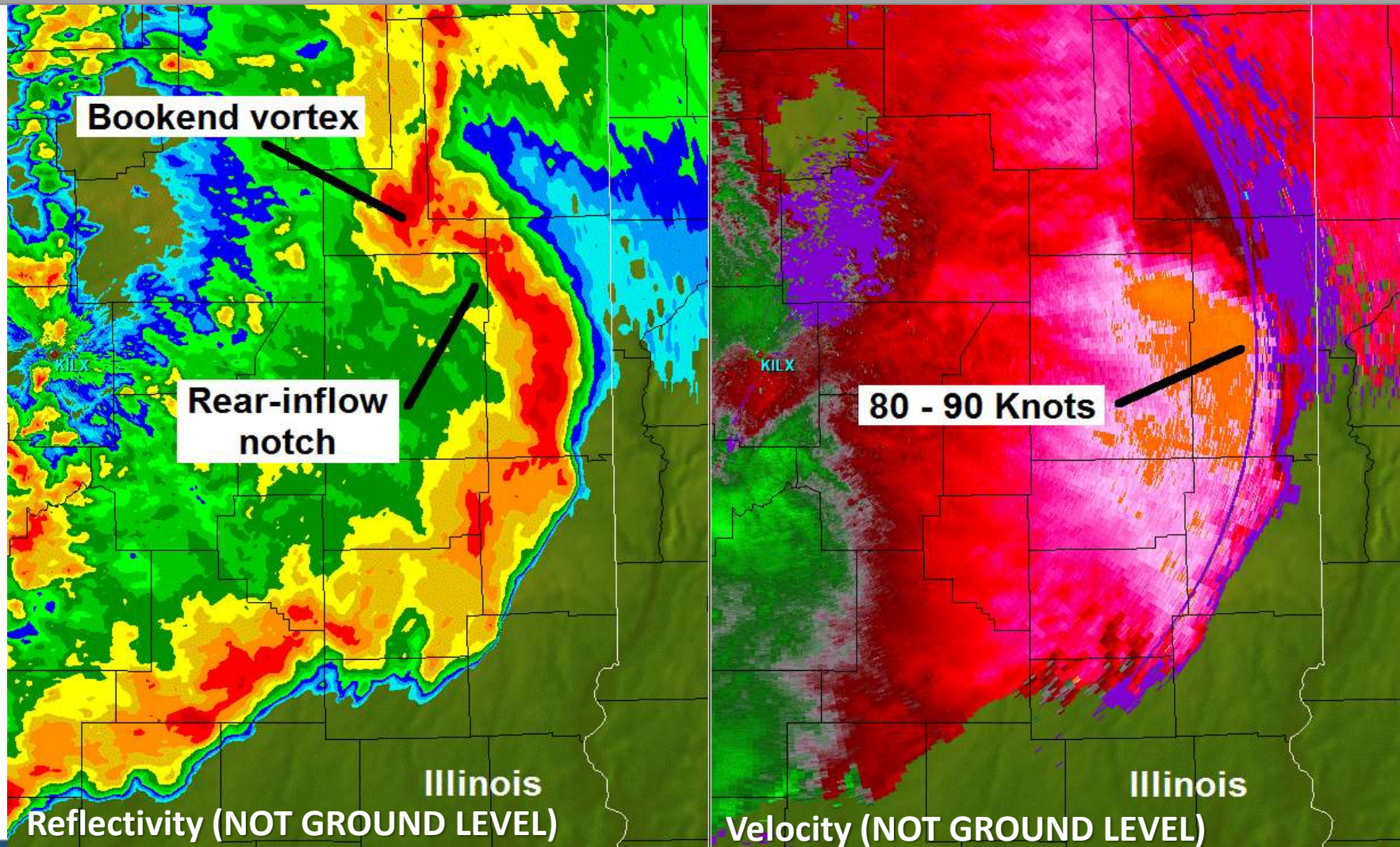
- Cover large areas, even multiple states at once
- Often occur at night, continue into daylight hours when they usually weaken
- Produce boundaries and eddies that may lead to next day severe storms
- Can also “disrupt” the atmosphere and inhibit next day thunderstorms





Multi-cell – Squall Line or Bow Echo

What You Might See on Radar – Fast Moving



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Indianapolis, Indiana

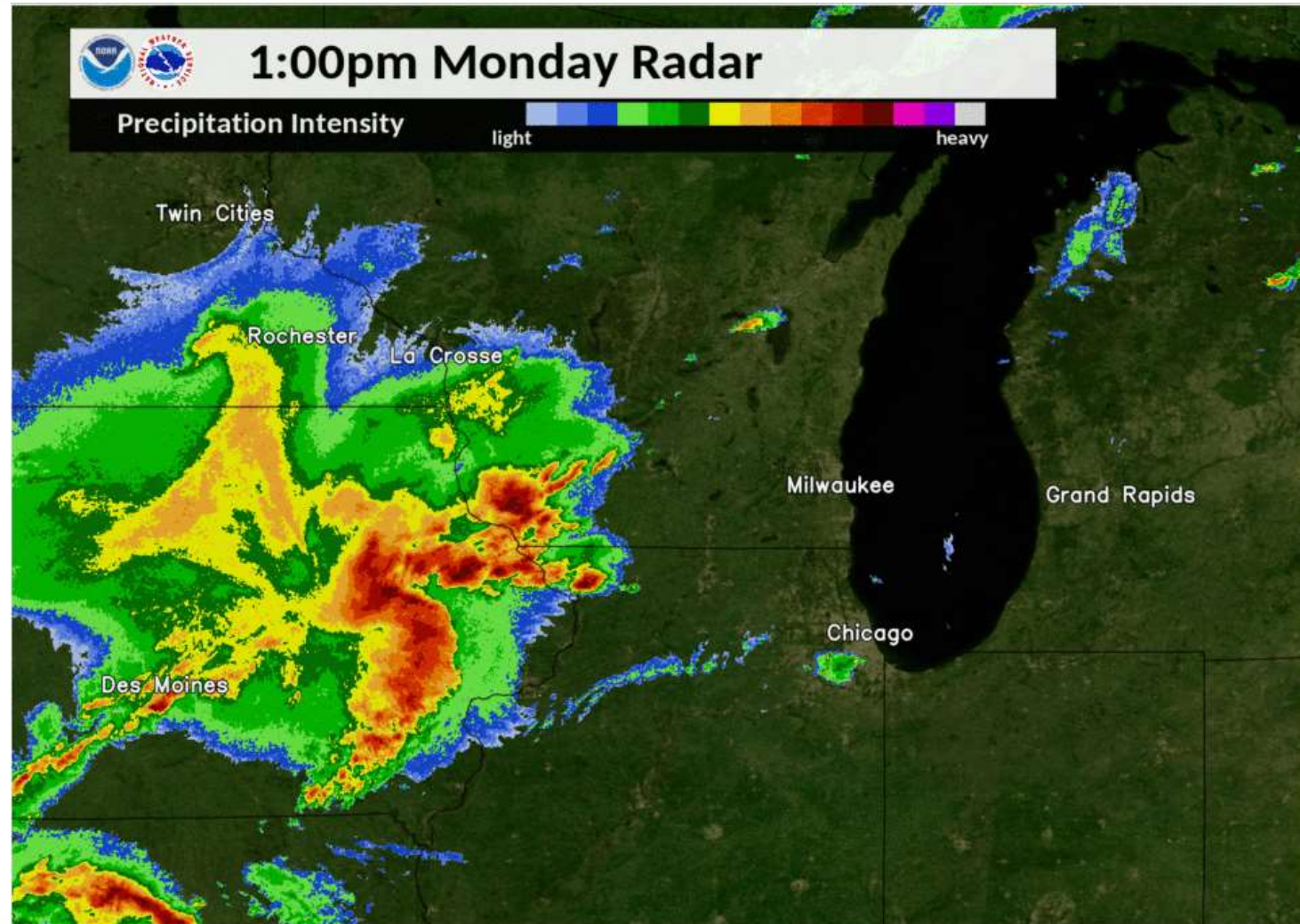


Multi-cell Line - Derecho

August 10th, 2020



- Wind Damage covered more than 90,000 sq miles
- \$11.5 Billion in damages
- 4 fatalities, hundreds of injuries
- Peak wind gusts 140 mph in Cedar Rapids, IA
- Severe winds lasted more than 30 minutes in some locations
- 26 tornadoes



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<https://storymaps.arcgis.com/stories/f98352e2153b4865b99ba53b86021b65>



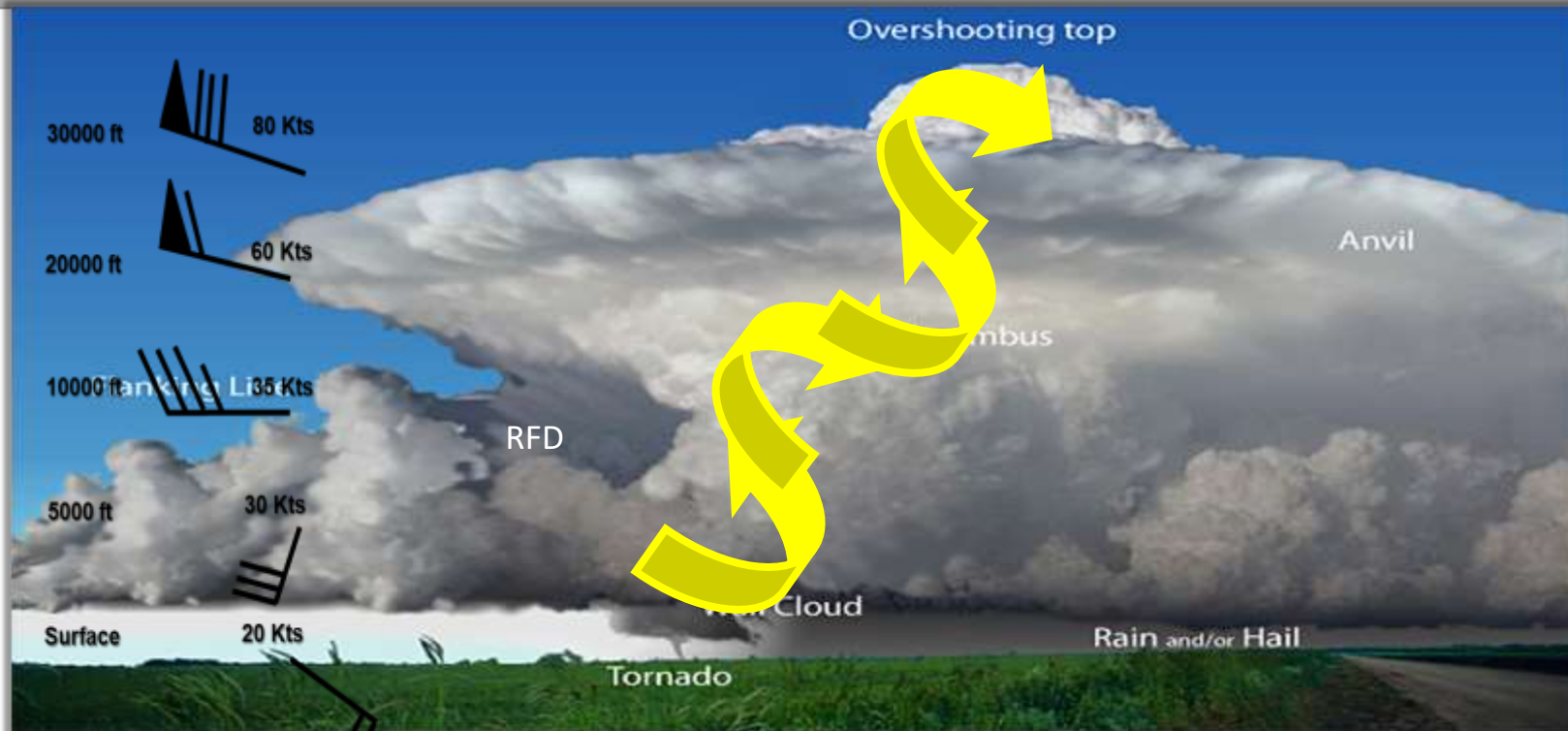
Indianapolis, Indiana



Supercell Thunderstorms

“Granddaddy” of Severe Storms – Most Deadly

- Persistent rotating updraft
 - Vertical wind shear
 - Directional
 - Speed
- Rear-flank downdraft
- Wall Cloud
- Tornado
 - Long lived, violent possible
 - Responsible for most tornado fatalities



Overall Severe Weather Threat Level: **High**

Hail



Wind



Heavy
Rain



Tornado

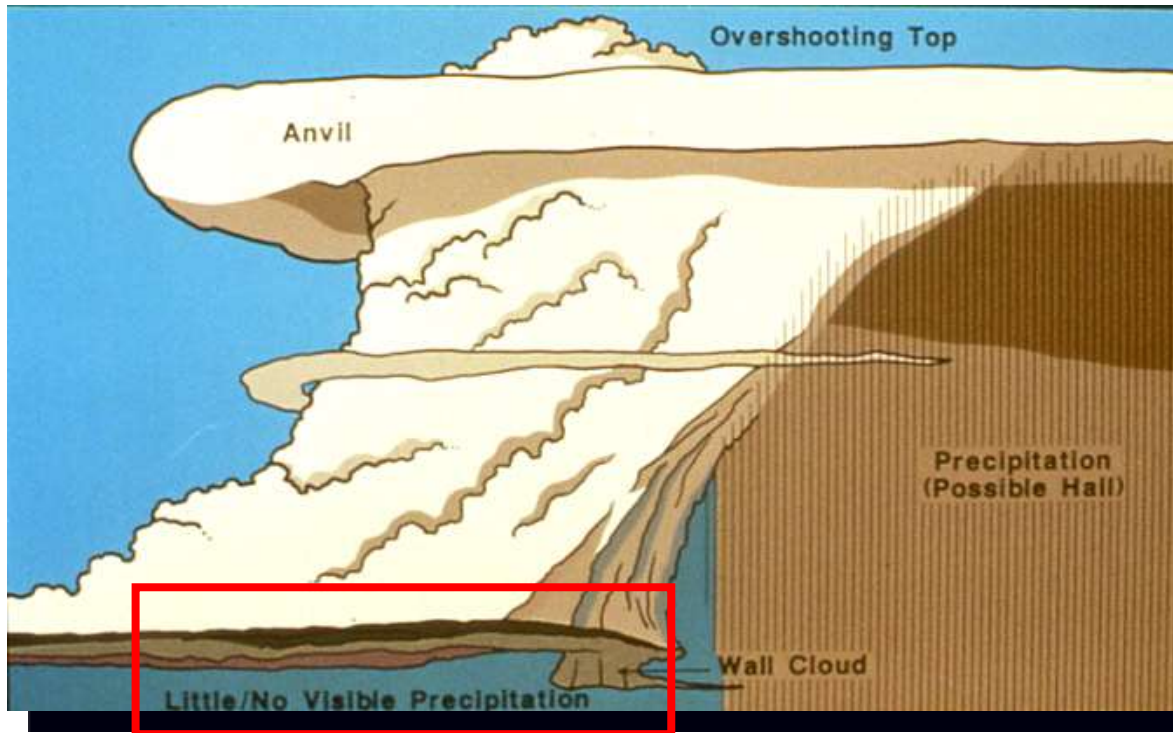




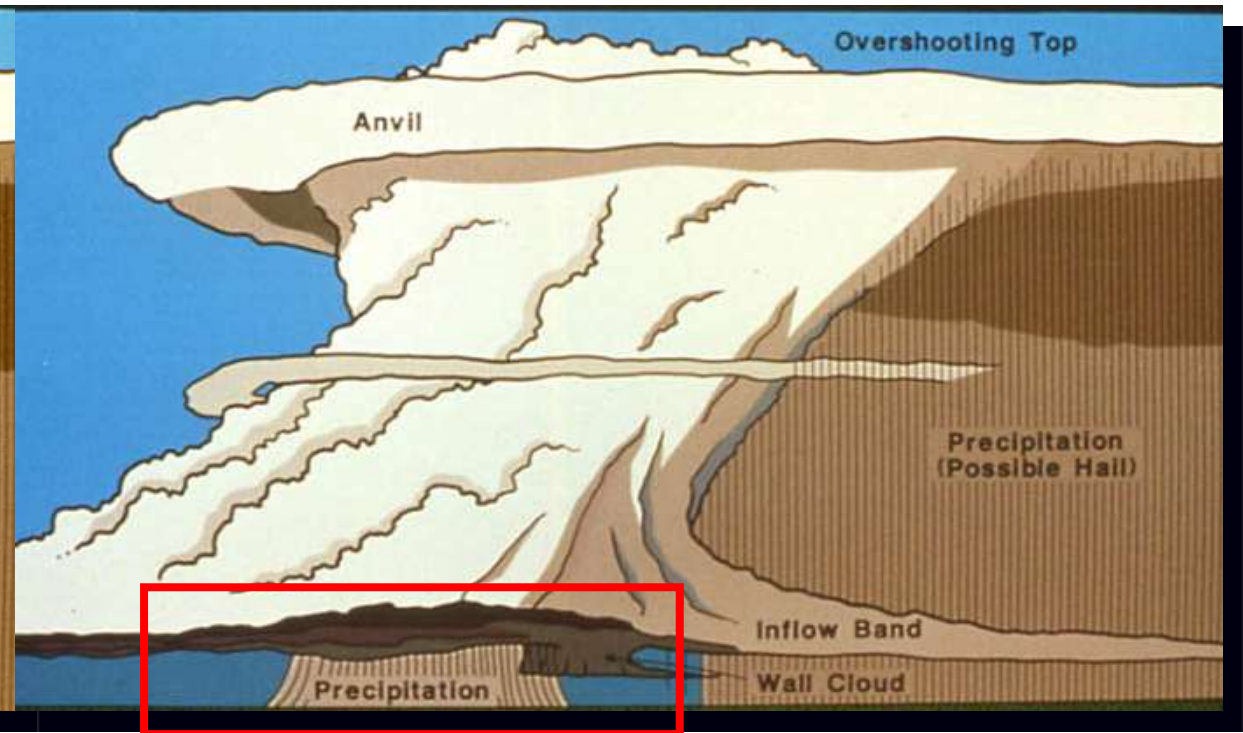
Classic vs “HP” Supercell

Tornadoes with HP Supercells will be rain wrapped

Classic Supercell

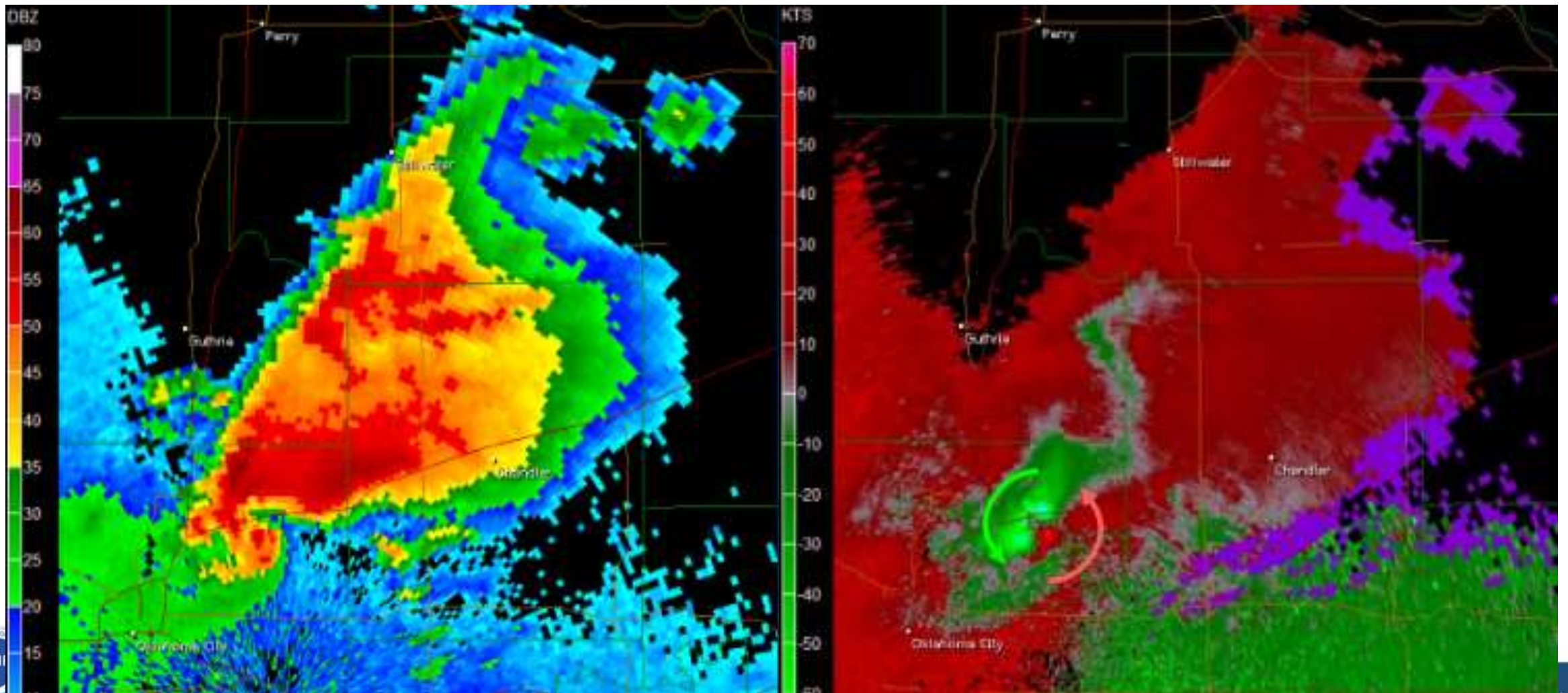


High Precipitation Supercell



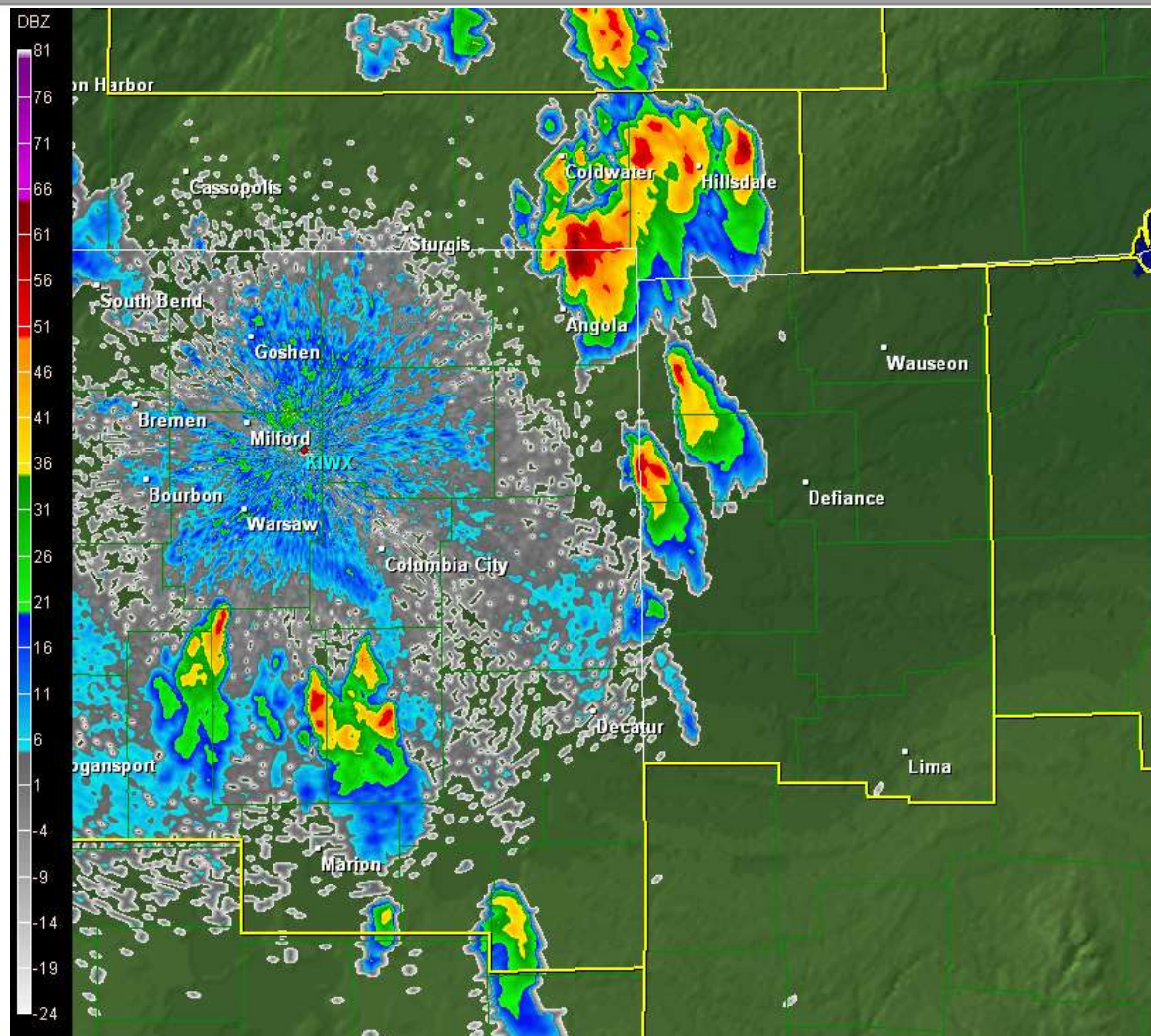


Supercell on Radar





Supercell on Radar





Supercell in Indiana

Henryville, IN – March 2nd, 2012



Radar Images from Radarscope



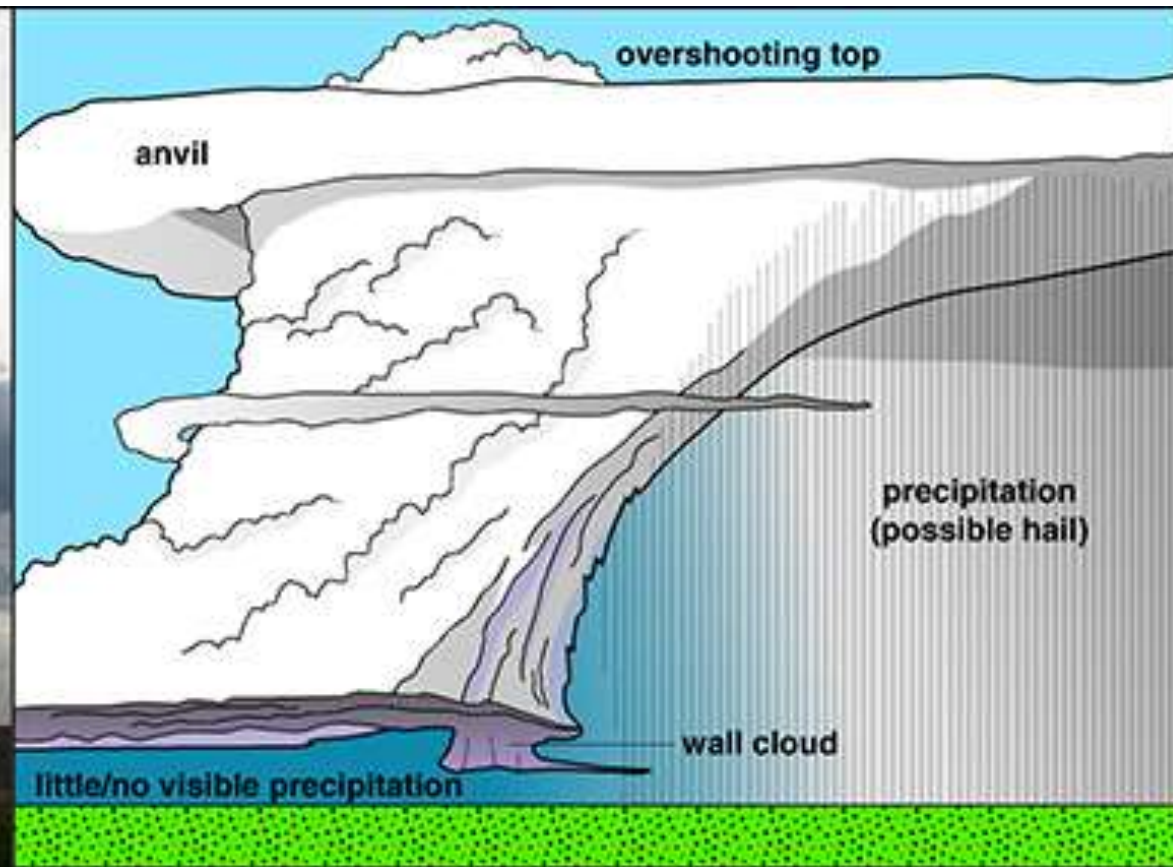
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Indianapolis, Indiana



Supercell Features – Rotating Updrafts





Supercell Features – Wall Clouds and Inflow

© 2008 Roger Edwards



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Indianapolis, Indiana



Supercell Features – Wall Clouds and Inflow

- Rotating cloud lowering below the updraft
- Often precedes a funnel cloud or tornado within a supercell
- Slopes toward rain





Shelf or Wall Cloud?

SHELF





Shelf or Wall Cloud?

WALL





Shelf or Wall Cloud?

WALL



Jeremy Hylka





Shelf or Wall Cloud?

SHELF





Wall Clouds & Funnel Clouds





Wall Clouds & Funnel Clouds

Wall Cloud

- Isolated cylindrical lowering

Funnel Cloud

- Rotating feature aloft
- Associated with Wall Cloud
- Does NOT touch the ground
- Let us know immediately any time you see a Wall Cloud and/or Funnel Cloud

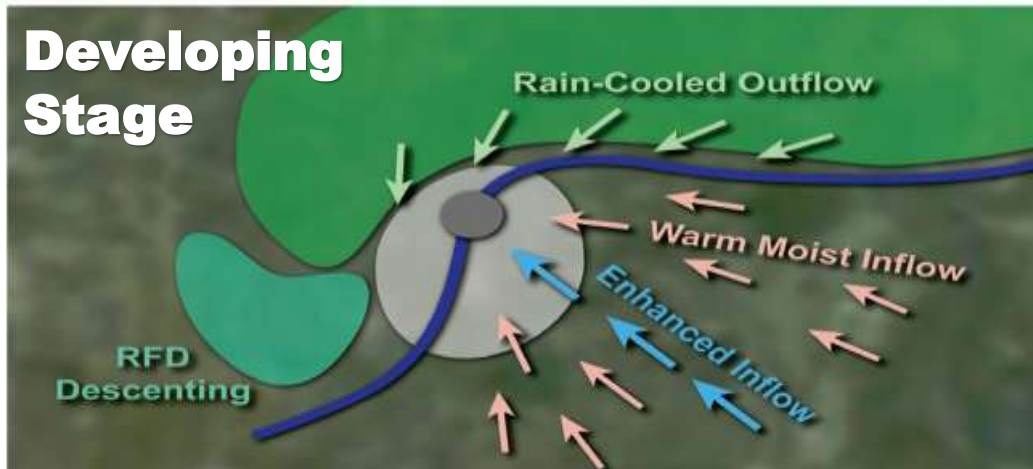




Visual Clues of Tornado Formation

Developing Stage – Don't be fooled by a rain shaft

Developing Stage



Looking Northwest



Looking Northwest



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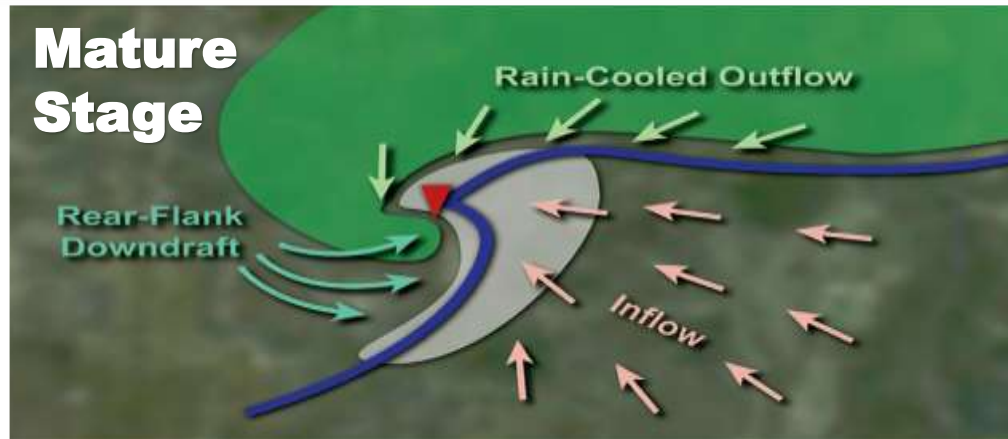


Indianapolis, Indiana



Visual Clues of Tornado Formation

Mature Stage of Henryville, IN Tornado – March 2nd, 2012





Visual Clues of Tornado Formation

Dissipating Stage, possible cyclic stage with new tornado

Dissipating Stage



Looking Northeast



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Photos by Chuck Doswell and Roger Edwards



Tornado Ratings: EF Scale



- EF – Enhanced Fujita Scale
 - Tornado rating based on damage intensity to “well built structures”. Wind speeds are derived from damage and associated indicators

EF Rating	Wind Speeds	Expected Damage	
EF-0	65-85 mph	'Minor' damage: shingles blown off or parts of a roof peeled off, damage to gutters/siding, branches broken off trees, shallow rooted trees toppled.	 
EF-1	86-110 mph	'Moderate' damage: more significant roof damage, windows broken, exterior doors damaged or lost, mobile homes overturned or badly damaged.	 
EF-2	111-135 mph	'Considerable' damage: roofs torn off well constructed homes, homes shifted off their foundation, mobile homes completely destroyed, large trees snapped or uprooted, cars can be tossed.	 
EF-3	136-165 mph	'Severe' damage: entire stories of well constructed homes destroyed, significant damage done to large buildings, homes with weak foundations can be blown away, trees begin to lose their bark.	 
EF-4	166-200 mph	'Extreme' damage: Well constructed homes are leveled, cars are thrown significant distances, top story exterior walls of masonry buildings would likely collapse.	 
EF-5	> 200 mph	'Massive/incredible' damage: Well constructed homes are swept away, steel-reinforced concrete structures are critically damaged, high-rise buildings sustain severe structural damage, trees are usually completely debarked, stripped of branches and snapped.	 

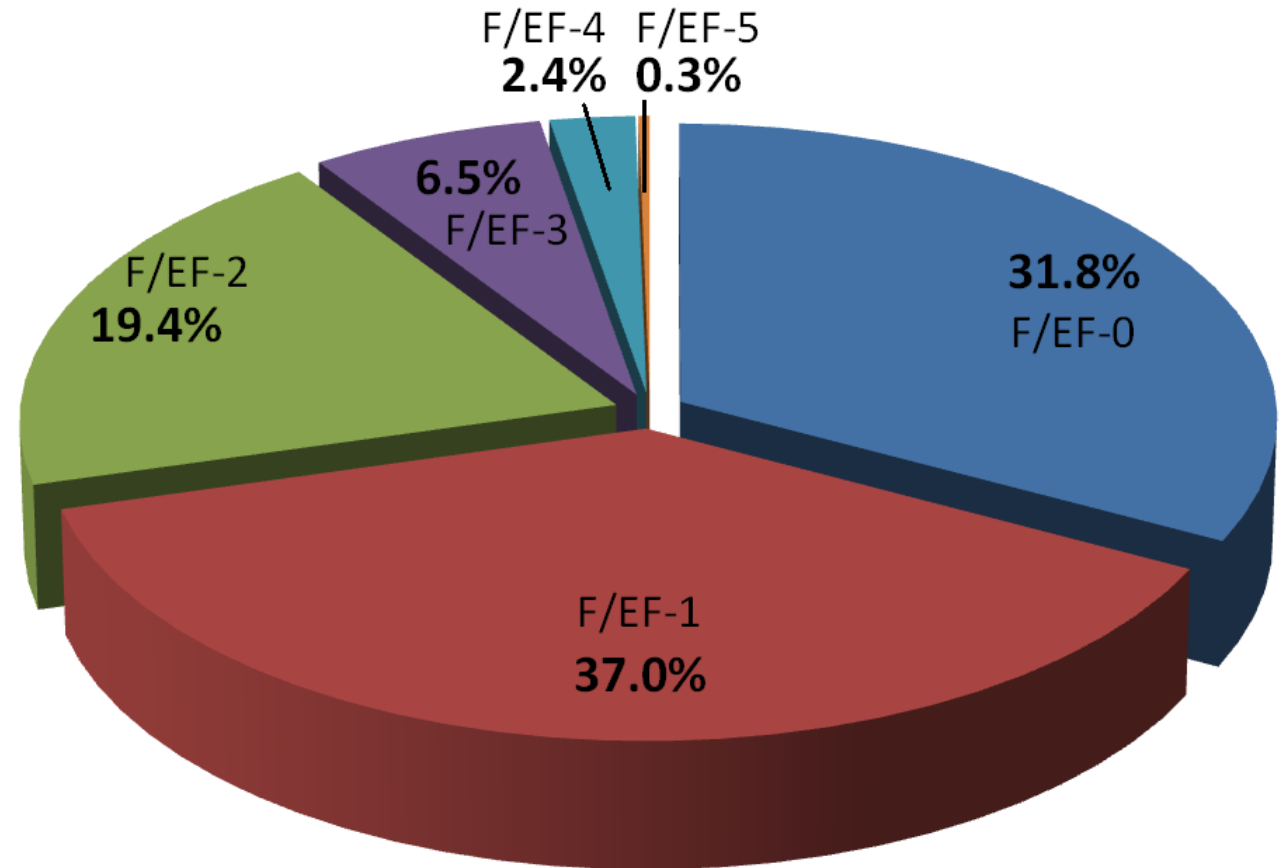




Indiana Tornadoes

- Nearly 70% of all tornadoes are either EF0 or EF1
- Roughly 3% of all tornadoes are violent (EF4/EF5)
- Last Indiana EF4: 3/2/2012 Henryville
- Last Indiana EF5:
 - 4/3/1974 (3 total)

Indiana Tornadoes by F/EF-Scale (1950-2021)





Indiana Tornado Fatalities

- 75 percent of all fatalities since 1950 (231) have been due to just 2.2 percent of all tornadoes (EF4/EF5)
- EF0 and EF1 tornadoes make up 70 percent of all Indiana tornadoes but account for just 2 percent of all fatalities (6) since 1950

INDIANA TORNADO DEATHS By Decade, F-Scale									
<u>F-scale</u>	1950s	1960s	1970s	1980s	1990s	2000s	2010-20	ALL	1980-20
F5/EF5			9					9	0
F4/EF4	1	154	33	2	10		22	222	34
F3/EF3	4	12	10	2	2	27	3	60	34
F2/EF2			1	2	4	2		9	8
F1/EF1		2	3	1				6	1
F0/EF0								0	0
Decadal Totals	5	168	56	7	16	29	25	306	77



Spotter Resources





NWS Webpages

One stop for all your weather info



The screenshot displays the NWS Indianapolis website interface. At the top is the National Weather Service logo and navigation tabs: HOME, FORECAST, PAST WEATHER, SAFETY, INFORMATION, EDUCATION, NEWS, SEARCH, and ABOUT. Below the navigation bar, there's a 'Local forecast by City, State or ZIP code' search bar. The main content area is divided into several sections: 'News Headlines' with links to winter storm summaries and preparedness information; 'MY FORECAST Indianapolis IN' showing current conditions (22°F, -6°C) and a 20% chance of snow; a large map of the Indianapolis area with a legend for 'Watches, Warnings & Advisories' (Winter Storm Warning, Winter Weather Advisory, Hazardous Weather Outlook); and a 'More Light Snow Expected' section with a detailed forecast map. At the bottom, there are three smaller maps labeled 'Weather Story', 'Weather Map', and 'Local Radar'.

• **Web Briefings**

• **Weather Story**

• **Hazardous Weather Outlook**

• **Latest Radar**

<https://www.weather.gov/ind>



Indiana Weather Briefing Page



- Current Hazards
- Latest Weather Stories
- Statewide Forecast Graphics
- Severe Weather Outlooks
- Rainfall Amounts
- Long range Outlooks

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HOME FORECAST PAST WEATHER SAFETY INFORMATION EDUCATION NEWS SEARCH ABOUT

Local forecast by "City, St" or ZIP code
Enter location ... [Location Help](#)

News Headlines
Interested in Becoming a Weather Ready Nation Ambassador? Here's How!

Briefing for Indiana
[Weather.gov](#) > [Indianapolis, IN](#) > Briefing for Indiana

Indianapolis, IN
Weather Forecast Office

Current Hazards Current Conditions Radar Forecasts Rivers and Lakes Climate and Past Weather Local Programs

NWS Indiana Decision Support

Current Conditions and Seven Day Forecast
City, St, or Zip Code

Legend:
Winter Weather Advisory (Blue)
Small Craft Advisory (Pink)
Wind Chill Advisory (Green)

Current Hazards Weather Stories Forecast Graphics Severe Weather Winter Rainfall Long Range

Current Hazards/Conditions for NWS offices serving Indiana





Other Online Resources

- **College of DuPage – NWS Radar, Satellite**

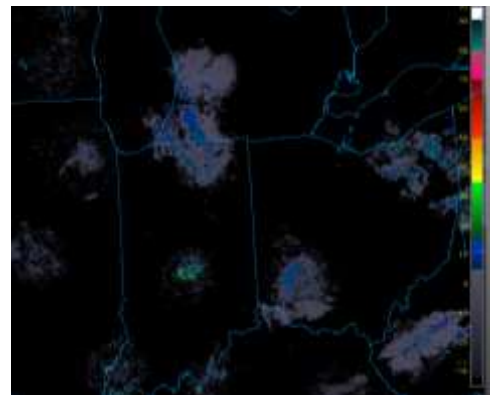
- <https://weather.cod.edu/satrad/>

- **iNWS – Site Specific Mobile Text Alerts**

- <https://inws.ncep.noaa.gov/>

- **NWS Weather Threat Table (Prototype)**

- <https://www.weather.gov/crh/threatmatrix>



Indianapolis, IN		Tuesday														Wednesday		Thursday		Friday		Saturday		Sunday		Monday	
		Tue 1/25 8AM	Tue 1/25 9AM	Tue 1/25 10AM	Tue 1/25 11AM	Tue 1/25 12PM	Tue 1/25 1PM	Tue 1/25 2PM	Tue 1/25 3PM	Tue 1/25 4PM	Tue 1/25 5PM	Tue 1/25 6PM	Tue 1/25 7PM	Tue 1/25 8PM	Tue 1/25 9PM	Tue 1/25 10PM	Tue 1/25 11PM										
Temperature (F)		13	15	17	19	20	22	22	22	21	20	18	17	16	14	13	12										
Sky Cover (%)		22	24	26	27	27	24	19	8	4	4	3	8	0	17	17	5										
Dewpoint (F)		5	6	6	7	7	7	6	5	5	5	5	5	4	3	2	1										
Relative Humidity (%)		73	67	64	58	56	52	48	45	48	51	56	58	61	63	63	63										
Heat Index (F)		-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-										
Wind Chill (F)		-2	2	4	7	9	10	12	11	9	8	7	5	3	2	0	-3										
Wind Direction (degrees)		nnw	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW										
Wind Speed (mph)		9	8	8	8	8	8	9	9	9	9	8	8	8	8	8	9										
Wind Gust (mph)		16	15	14	12	10	9	10	12	12	13	15	14	15	18	18	16										
Weather		None	None	None	None	None	None	None	None	None	None	None	None	None	None	None	None										
Probability of Precipitation (%)		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0										
Precipitation (in)		0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00										
Ice Accumulation (in)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0										
Snowfall Amount (in)		0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0	0.0										
Ceiling Height (ft)		skc	skc	skc	skc	skc	skc	skc	skc	skc	skc	skc	skc	skc	skc	skc	skc										
Visibility (mi)		10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10										
Transport Wind Speed (mph)		9	9	12	12	9	8	8	9	9	9	10	10	13	13	13	15										
Mixing Height (ft)		1136	1177	1483	1886	2497	2014	3172	3132	2857	2320	1994	1866	1630	1361	1328	1528										
Haines Index		5	5	5	5	5	5	5	5	5	5	5	4	4	4	4	4										
Lightning Activity Level		1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1										
Twenty Foot Wind Speed (mph)		8	7	7	7	7	7	8	8	8	8	7	7	7	7	7	8										
Twenty Foot Wind Direction (degrees)		nnw	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW	NW										
Atmospheric Dispersion Index		13	13	20	21	22	20	20	23	21	7	7	7	8	8	8	9										



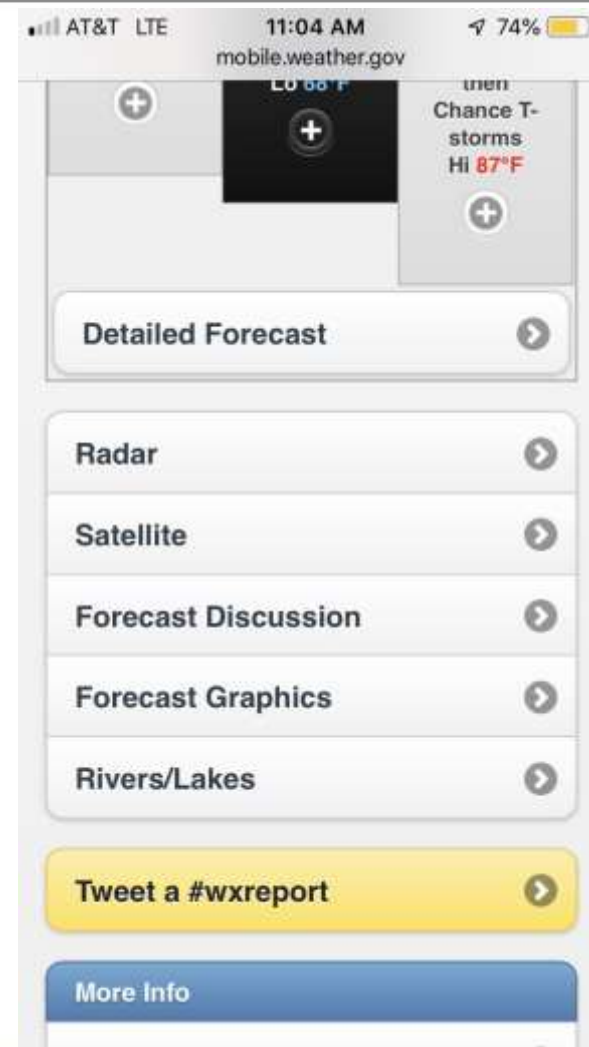


NWS Forecasts for Your Phone

“It acts like an App but it’s not really an App”



- Open Safari or Internet
- Go to mobile.weather.gov
- Enter Zip Code
- Look at forecast, Scroll down to Forecast Discussion if desired
- Save to your home screen and it will act like an App





Other Possible Phone Apps

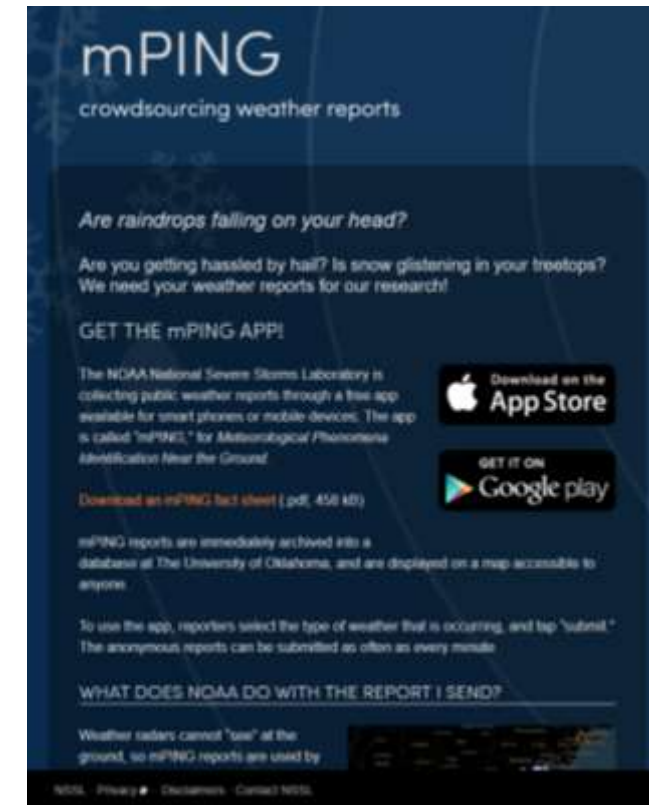
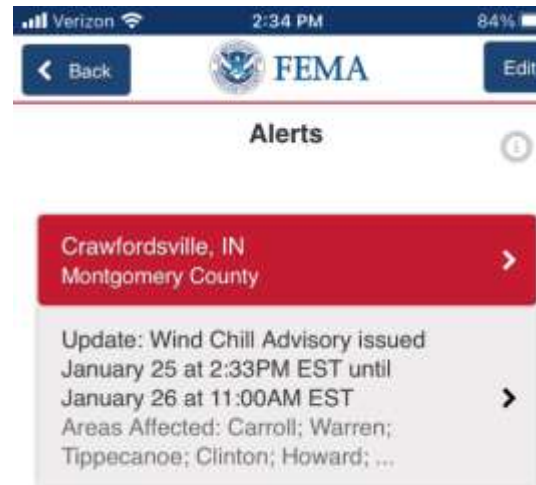
Available from your App Store – NWS Does Not Endorse any Apps

- FEMA App for Warning Notifications

– <https://www.fema.gov/>

- mPING for Precipitation Reports

– <https://mping.nssl.noaa.gov/>





NOAA All Hazards Weather Radio

Your Own Personal Weather Monitoring and Alert Device



GET THE INFORMATION YOU NEED...24 HOURS A DAY...GET A **NOAA WEATHER RADIO!**





Additional Easy Ways to Volunteer

**Community Collaborative
Rain, Hail, & Snow Network**

**A Great Help to
the NWS!**

For more info: www.cocorahs.org



SCAN ME



- A grassroots, non-profit, community based, high density precipitation network
- Take daily precipitation measurements that are sent to the NWS and used by many
- Have a group who would be interested in participating? Contact us to set up a training session



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Indianapolis, Indiana



Additional Training Resources

SKYWARN® Spotter Training



Languages: English
Completion Time: 2 hrs
Topics:
Other, Convective Weather

Enrollment Information:

Enroll

https://www.meted.ucar.edu/training_course.php?id=23

<http://goo.gl/CWYtj>



<http://www.spotternetwork.org/>

<https://www.weather.gov/ind/spotter>
Local Resources and training aids



SCAN ME



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Indianapolis, Indiana



Weather Ready Nation Ambassador

Does your School, business or organization promote weather safety and preparedness?



weather.gov/wrn

Apply Today!



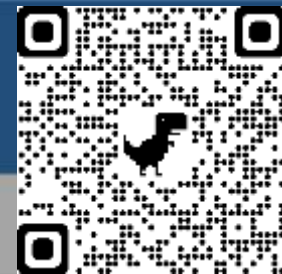
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Indianapolis, Indiana



Remember



- A PDF version of these slides with speaker notes and other resources are available on our Spotter Webpage.
<https://www.weather.gov/ind/spotter>
- Central Indiana Skywarn Spotters DO NOT receive spotter ID numbers
- You are a volunteer, not certified or “official”. You cannot break laws or use this training as an excuse for unlawful acts
- Your safety is top priority, do not put yourself in harms way





Reporting Methods and Questions

Don't forget this information



- Social Media (Facebook and Twitter)
 - @NWSIndianapolis
 - Hashtags - #INwx #NWSIND
- Spotter Reports Hotline - (800) 499-2133
- Submit Report via NWS Indy website (inws.ncep.noaa.gov/report)
- Email (nws.indianapolis@noaa.gov)
- Amateur Radio



Questions or comments on this presentation can be sent to:
Sam.Lashley@noaa.gov

